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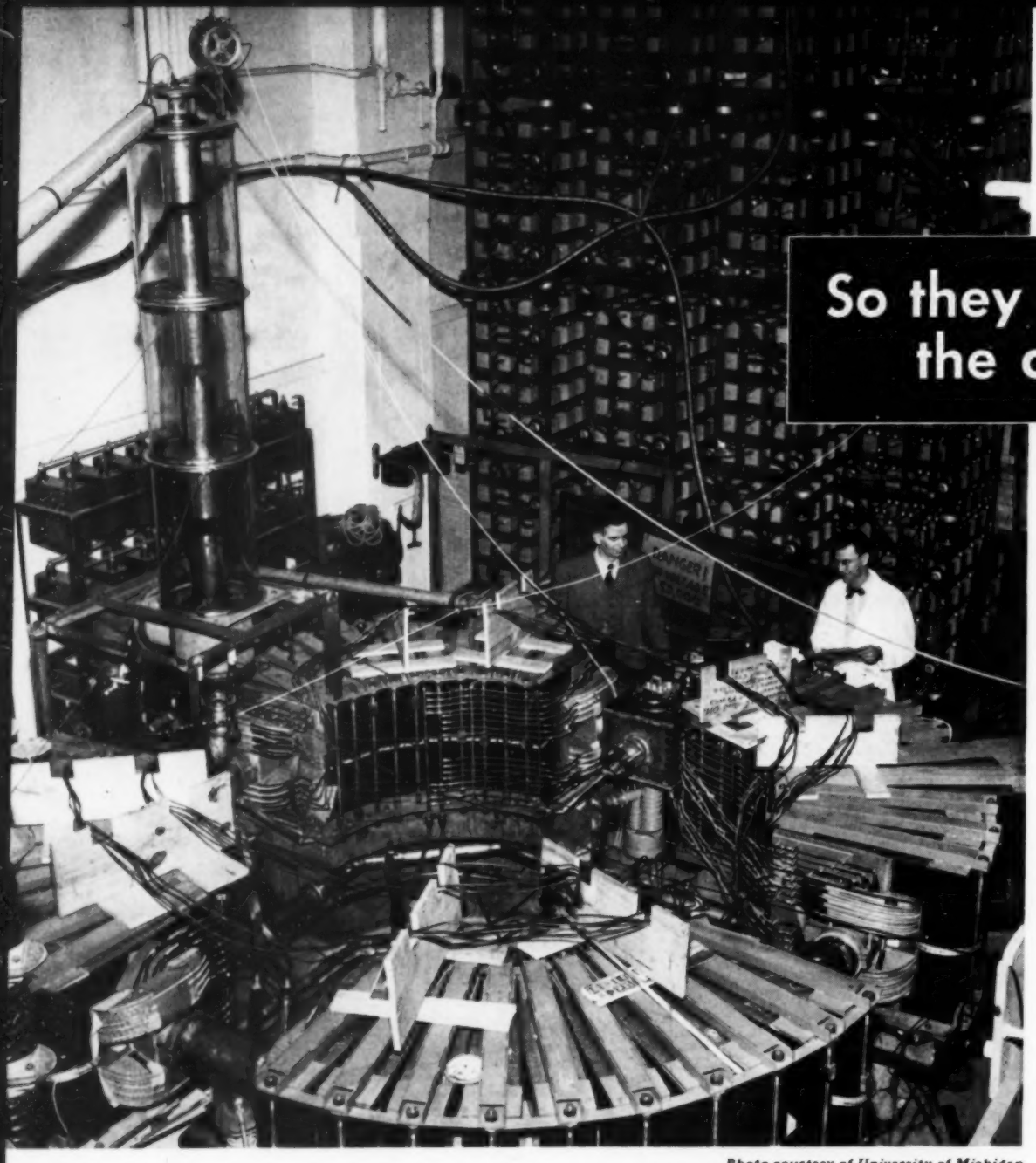
Industrial Arts and Vocational Education

December, 1952 Vol. 41, No. 10

PRE-CONVENTION NUMBER



So they removed the ceiling

Photo courtesy of University of Michigan

The roads are many that lead to a solution of more of the world's problems. And the difficulties are great. In the field of physics, men work with atom smashers to solve power and other vital problems. But it was thought an impossible barrier stood ahead. The Relativity Theory states that as a projectile electron increases in energy it also gains in mass and you just can't keep boosting this doubly growing load. Physicists however removed that ceiling by designing the synchrotron in which a magnet jerks the laggard electron into position to receive the next propulsion of energy. Now 300 million volt electrons hit target material and create mesons!

It is not stretching the analogy too far to say the students in school are the projectile electrons which must be hurled against the target of their adult environment and that their impact and effect will be in proportion to the increasing mass of knowledge they must carry and the increasing energy with which they must strike.

The educator is the power that must keep laggard interest and ambition abreast of the pulse of events . . . the tide that, caught at its flood, leads on to victory.

How can the educator remove the ceiling and lift the young student to higher levels of applied energy and effectiveness? Obviously the *wise* educator works to establish early the habit of attention, of interest, of enthusiasm, of focused energy and zeal for achievement. ***And he does nothing to break that habit.*** So it is the instructor in mechanical drafting stresses the importance of this work which is preliminary and often fundamental not only to good habits but to great careers beyond.

He does nothing to nullify such impression. Above all he insists that the tools of this work, drawing instruments and supplies, be fine enough to further inspire the fledgling as he takes his first awkward steps toward the goal.

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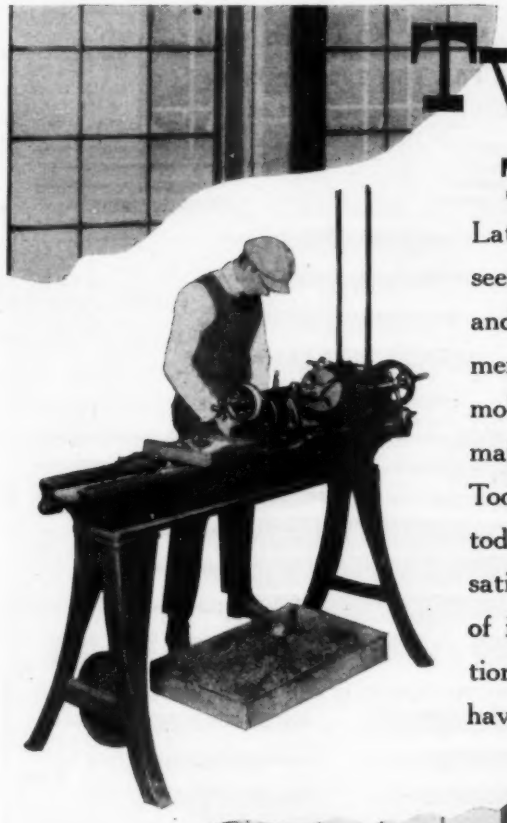

Two Generations

There have been a lot of changes since South Bend Lathes first appeared on the industrial scene. We have seen presidents, kings, and dictators come and go; industry and education have made great strides, and the dreams of men and boys have progressed from single cylinder automobile engines to supersonic jets. But one thing has remained constant, the quality of South Bend Machine Tools. Whether a boy learned to run a South Bend Lathe today or forty years ago he and his instructors had the satisfaction of knowing the machine was a standard tool of industry, and designed to meet the highest specifications of his generation. Industrial leaders of our nation have been, and are being trained on South Bend Lathes.

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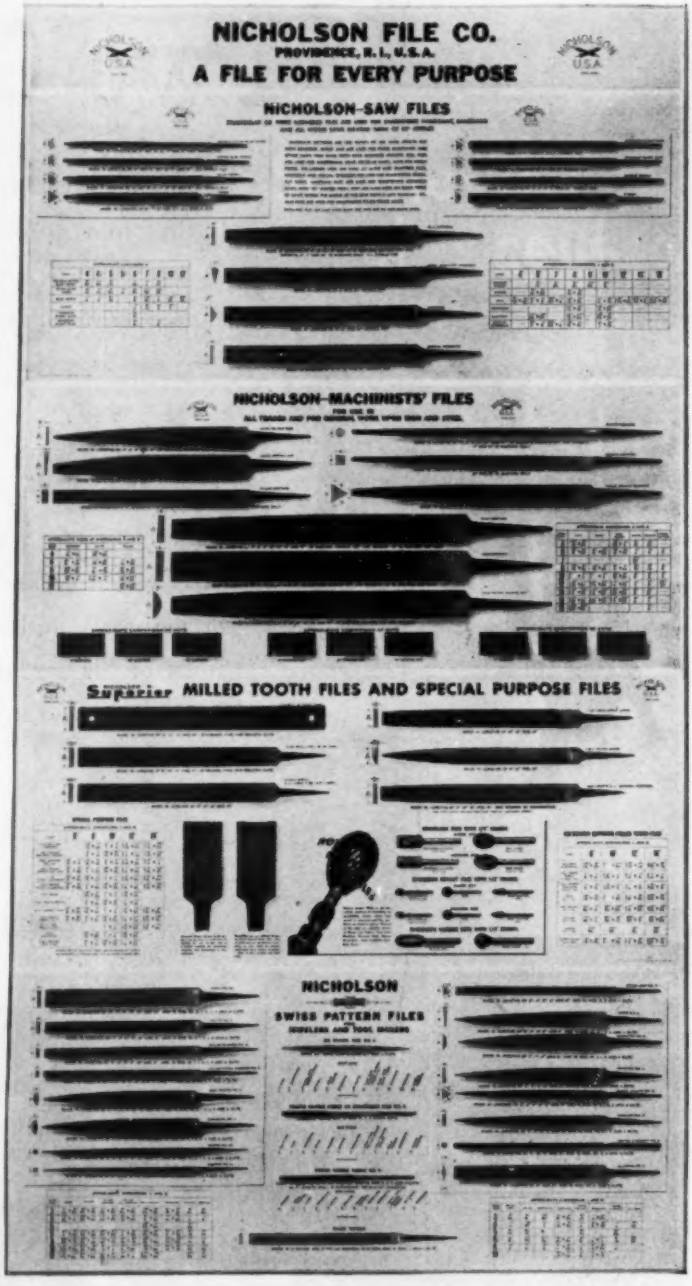

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Vol. 41 No. 10

DECEMBER, 1952

INDUSTRIAL ARTS *and* VOCATIONAL EDUCATION

THE SHOP TEACHERS' PROFESSIONAL MAGAZINE

Published on the 15th of month preceding date of issue

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☆ ☆ ☆

This Month's Cover

The December, 1952, cover of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION shows students of the industrial chemistry class at the Dobbins Vocational-Technical School of Philadelphia engrossed in experiments that are evidently very interesting.

This is an example of what America's technical schools are offering to students of high school age so they can equip themselves better for their future active life.

Photograph submitted by Benjamin J. Novak, Murrell Dobbins Vocational-Technical School, Philadelphia, Pa.; and Lecturer in Vocational Education, Temple University.

☆ ☆ ☆

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Editorial Contributions. — The Editor invites contributions bearing upon Industrial Arts, Vocational Education, and related subjects. Manuscripts, drawings, projects, news, etc., should be sent to the Publication Office in Milwaukee. Contributions are paid for upon publication. In all cases manuscripts should be accompanied by full return postage.

Articles Indexed. — The articles contained in the Magazine are regularly indexed in "The Readers' Guide to Periodical Literature," and "Education Index."

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NEW TECH BOOKS TO FILL TRAINING NEEDS

Automobile styles change to whet the car-owner's appetite for the "latest." Clothing fashions are born so that consumption will outrace the normal life of fabrics. But Tech Books appear for just one reason — *to meet an existing need for those books.* Where an up-to-date, satisfactory text is available, American Tech does not crowd the field with another. But when such texts are not available to schools, *we fill the gap.*

12 NEW BOOKS

Listed below are 12 Tech books published in the last year. Each is designed to plug a gap in industrial or vocational education. If you have been looking for a text on these subjects, write in for an examination copy.

1. AUTOMOTIVE ELECTRICAL SYSTEMS $4.90
2. AUTOMOTIVE MAINTENANCE AND TROUBLE SHOOTING $4.75
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9. RELATED MATHMETICS FOR CARPENTERS $2.25
10. A PROCEDURE FOR EVALUATING A LOCAL PROGRAM OF TRADE AND INDUSTRIAL EDUCATION $1.50
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Please send me on-approval copies of the books indicated by the number circled below.

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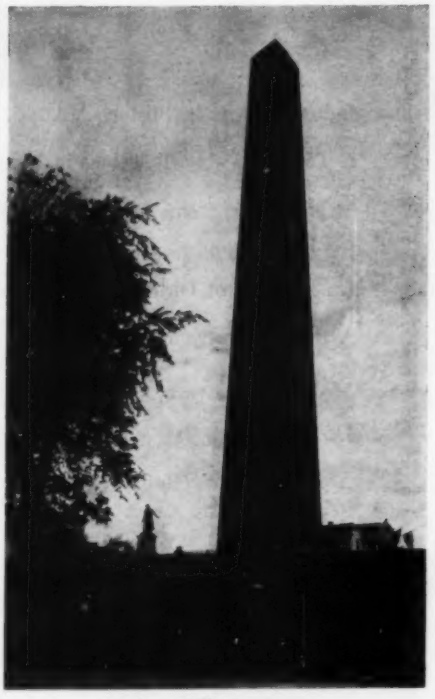
Association News

AVA CONVENTION AT BOSTON

The 46th Annual American Vocational Association convention will convene in the historically and educationally famous city of Boston, December 1 to 5, 1952.

No one interested in industrial arts and/or vocational education should miss this opportunity to attend this convention.



Bunker Hill Monument
— Photograph, Convention Bureau, Boston Chamber of Commerce

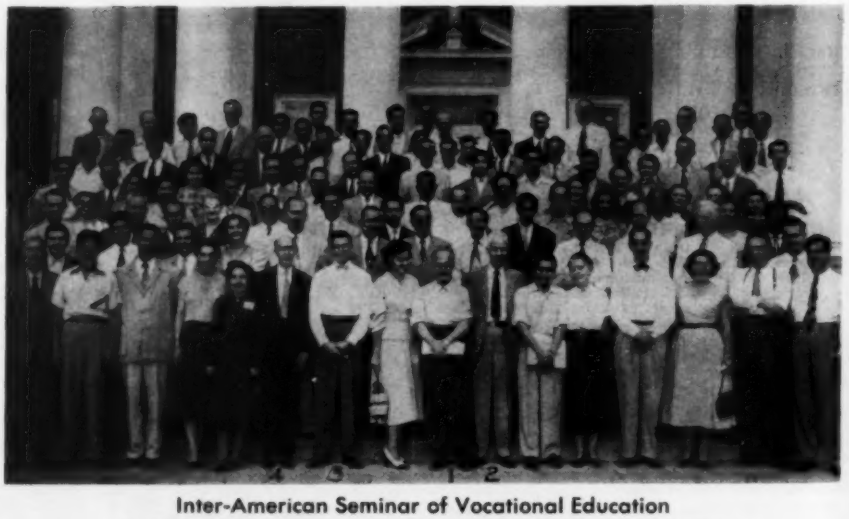
Frigate Constitution
"Old Ironsides"
— Photograph, Convention Bureau, Boston Chamber of Commerce

Special sectional programs for agriculture, business, distributive education, home economics, industrial arts, trade and industrial education, and vocational guidance, packed as they always are with interesting and practical information for administrators, directors, supervisors, and teachers, will be worth the while of anyone interested in these various fields.

The Boston convention will offer a special program on safety sponsored by the American Vocational Association safety committee and the National Safety Council. The theme of this program is broad and embracing, since it takes in safety as applied to the home, industrial education, and agriculture.

Besides the values offered so generously by the discussions which are offered by the general and special meetings, there are the cultural, historical, industrial, commercial, and scenic wealth which Boston holds out to those who will attend this year's AVA convention.

(Continued on page 6A



Inter-American Seminar of Vocational Education
1. Dr. Fernando Romero, Pan American Union, Director of the Seminar
2. Dr. R. W. Gregory, Chief of the U. S. A. delegation
3. Dr. Louis Q. Moss, I.L.O. Representative, and Deputy Director
4. Dr. R. Lee Hornbake, Executive Council, University of Maryland

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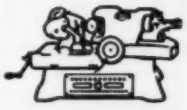
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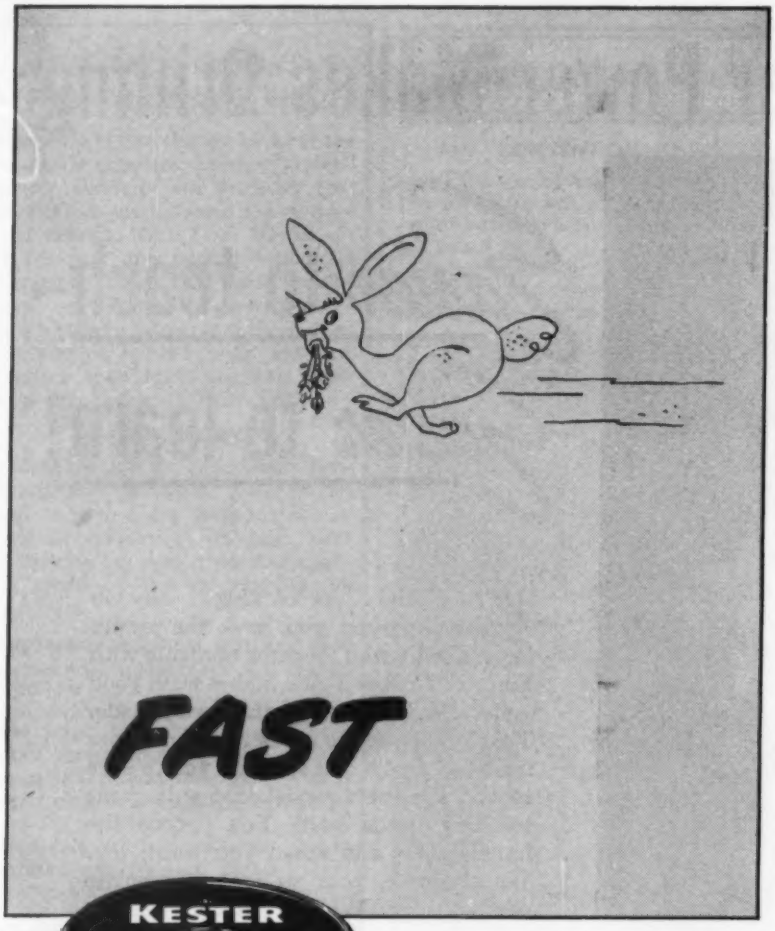
VALVE SEAT GRINDERS



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ASSOCIATION NEWS

(Continued from page 4A)

Then the visitor should remember that he will have the opportunity to meet the national leaders of industrial arts and vocational education all gathered for him to become acquainted with, to say nothing about seeing old acquaintainces from days gone by.

Then, too, many manufacturers and dealers will be there to show new tools, machinery, books, and equipment.

Don't miss this opportunity. Join your co-workers and make this convention a success.

MIDWESTERN OHIO INDUSTRIAL ARTS ASSOCIATION

The officers of Midwestern Ohio Industrial Arts Association for 1952–53 are: Harry Adams, Toledo, Ohio, president; Darwin C. Eaton, Swanton, Ohio, vice-president; Harry Miner, Tontogany, Ohio, second vice-president; and Lester Riggle, Defiance, Ohio, secretary and treasurer.

Dates and subjects for coming meetings are: November 19 — demonstration night at Swanton; January 21 — administrator's night at Weston; February 18 — visiting night (General Motors Foundry), at Defiance; March 18 — project night; April 15 — social ladies' night.

KEN STODDARD APPOINTED PRESIDENT OF MU SIGMA PI

In accordance with constitutional procedure of Mu Sigma Pi, the fraternity executive board has appointed Ken Stoddard to assume the office of president, following the approved resignation of Fred Nicholson. The appointment is in effect for the duration of the term of the present officers.

Mr. Nicholson will attend a theological seminary in Alexandria, Va. He was honored at a special dinner meeting of the fraternity in September.

♦ Officers of the Illinois Industrial Education Association are: Edward M. Claude, president; W. P. Klingensmith, secretary; and James S. Crowe, treasurer. Vice-presidents are: Michael C. Habian, trade and industry; Walter A. Klehm, industrial arts; and Harold S. Robbinus, personnel and guidance.

♦ The executive committee of the National Association of Industrial Teacher Educators has announced that a News Letter semiannually will henceforth be issued.

Current officers of this association are: James R. D. Eddy, University of Texas, president; Willard M. Bateson, University of Michigan, secretary-treasurer. Vice-presidents are: Clarence T. Baab, Colorado State College of Education; H. C. Thayer, Wisconsin State Board of Vocational Education; and A. P. Twogood, Iowa State College.

♦ Officers of the Lone Star Vocational Association are as follows: Bridges A. Turner, director, Texas Southern University School of Vocational and Industrial Education, president; Waddell H. Steward, secretary; and James R. Alexander, treasurer.

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and Exclusive Value Features!

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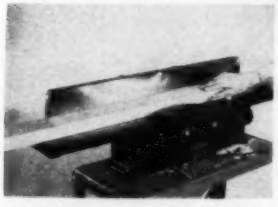
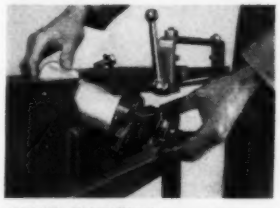
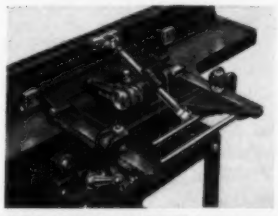


SAFER! The extra-long Atlas table and fence provide solid, safe support. Blades are covered front and rear of fence!



MORE EFFICIENT! Removable cutterhead saves many hours each semester in blade sharpening.



NEW FENCE MOUNT! A 3-point rigid mounting, positive 45° stops, exclusive width-of-rabbet scale.

MORE VERSATILE! Fence removes to provide over 12" wide support for planing wide boards.

Helps Make Students' Shop Time More Productive Than Ever

A 5-minute comparison and most vocational educators agree: *this is the finest 6" jointer-planer ever developed for the school shop!*

Your yardstick will show you the safe, work-support size of the tables and fence. Note that the Atlas fence is longer than the tables of some jointers! And both tables and fence are close-tolerance ground to a mirror-smooth finish—*with table surfaces aligning to within .005" over-all!* That's accuracy that helps you teach the value and thrill of precise workmanship.

The rear table is stationary—saves time, improves work accuracy. Note how it widens for planing large boards with fence removed. Note the rigid fence mounting, adjustable stops, and exclusive width-of-rabbet scale. And another important feature—the cutterhead is removable for sharpening blades without disturbing their setting! Cutter-head-spindle is one piece solid steel—spins on sealed-for-life ball bearings.

The Atlas 6" jointer-planer is a sound tool investment for your school. Ask your Atlas dealer to show you all its many features.

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Personal News

CHARLES BAUDER DIES

Another leader of industrial arts and vocational education passes on. Charles F. Bauder, who had retired from the directorship of vocational education of Philadelphia last June, died at the age of 66 on October 12, 1952, after an illness of two weeks.

He was born at Philadelphia, Pa., January 17, 1886. He was graduated from the old Central Manual Training School in 1903. After receiving an electrical engineering degree from the University of Pittsburgh in 1907, he was appointed instructor of electrical engineering at that institution for one year.

Then he was made teacher of electricity and science at the Philadelphia Trade School from 1908 to 1919. From 1915 to 1919 he was principal of the Evening Trade School. He then was appointed head of the department of mechanical arts and industrial education of Central High School, Philadelphia, 1919–22; director of the division of industrial arts of the city of Philadelphia, a position which he held from 1922 to 1941; and then the division of vocational education and war production training was added to his duties in the years 1940–45. He received his master's degree from the University of Pennsylvania in 1919. Besides his other duties, he lectured at Pennsylvania during the years 1920–24, and he was summer school instructor at Pennsylvania State College from 1931–38.

He was a member of many local, state, and national organizations in the fields of industrial arts and vocational education, and was elected to membership of Kappa Phi Kappa, Mu Sigma Pi, and Epsilon Pi Tau, honorary fraternity in industrial arts education.

He contributed much to the professional literature of his field, and was very active in the professional associations to which he belonged.

Mr. Bauder is survived by his widow and two daughters.

DEAN BOWMAN RETIRES

Clyde A. Bowman, dean of the division of industrial education of The Stout Institute for 33 years, will retire at the close of the first semester in January.

He was born on July 18, 1887 at Prescott, Wis., attended high school at Superior and New London, Wis., and was graduated in 1905. He then attended River Falls State Teachers College from 1906 to 1907 and received a high school teacher's diploma. He attended Columbia University Teachers College, Columbia, Mo., 1914–15 to earn his B.S. degree, and 1915 to 1919 to do graduate work. He received his M.S. degree from the University of Wisconsin in 1927, and has done considerable work toward his doctoral degree at this institution.

Dean Clyde A. Bowman

Mr. Bowman started his teaching career at the El Paso, Tex., public schools where he was shop teacher in 1909. He was appointed director of manual training at Stillwater, Minn., 1909–11; director of manual arts at Stevens Point State Teachers College, Stevens Point, Wis., 1911–16; teacher of industrial arts, Columbia University Teachers College, 1916–19; dean, division of industrial education, The Stout Institute, Menomonie, Wis., 1919–52; and was lecturer in vocational education at the University of Wisconsin, 1927.

He taught summer school at Colorado State College, Fort Collins, Colo., 1932–34 and 1936–38; at Arizona State Teachers College, Flagstaff, Ariz., 1939; and at State College, Ames, Iowa, 1940 and 1941.

He entered service in the army in October, 1917, in World War I, and was released in 1919 as a lieutenant.

He is the author of a book, *Graphic Aids in Occupational Analysis for Guidance and Teaching*, and has contributed freely to the professional literature of his field.

(Continued on page 21A)

Powerful, Versatile No. 555 Impact Tool

Runs, sets, loosens, and removes nuts or studs, taps, threads, drives screws

Standard 1/2-inch square drive

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Light in weight and beautifully balanced, this new 7" Millers Falls Polisher is loaded with desirable features. It's a powerful (5 amps.), high-speed (1900 r.p.m.) unit that gives outstanding performance with the popular new automotive cleaners and polishes. It's versatile, too — excellent for producing high lustre finishes on wood. Write for full details.

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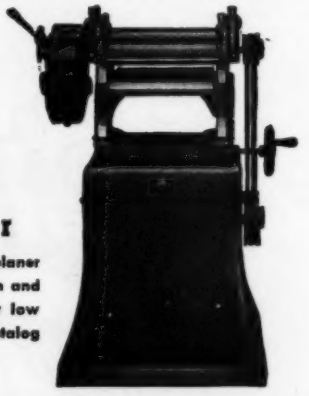

The PARKS Heavy-Duty 12" x 4" Planer

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Train your students to file saws on a Foley, for they will find thousands of Foley Saw Filers used in industry, Army, Navy, Air Corps, etc. Hundreds of schools and colleges use them to save on saw filing costs and replacement expense.

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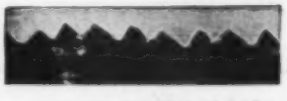

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CATALOG A-60 contains complete descriptions.

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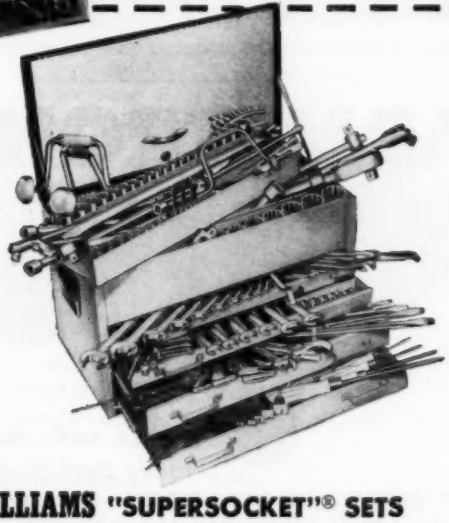

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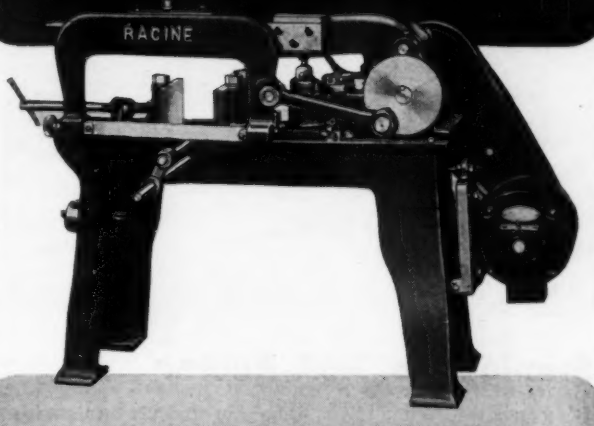

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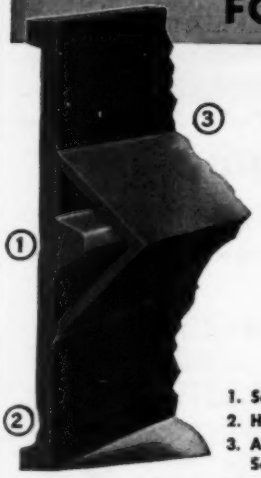

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HONOR AWARDS
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Otto E. Urain, Moorehead, Minn.
Arthur O. Berry, Portland, Me.
Delmar L. Cote, South Bend, Ind.
John F. O'Neal, Phoenix, Ariz.

DIVISION 2
High Schools (9-10-11-12 Grades)

FIRST PRIZE
E. H. Miller, Jal, New Mex.

HONOR AWARDS
Ray C. Stowell, Alameda. Cal.
Ray Neugart, Myrtle Point, Ore.
Ted D. Lane, Paxton, Ill.
Darrel A. Vernon, Trotwood, Ohio
Paul H. Kyburz, Lansing, Mich.

DIVISION 3
Junior High School (7-8-9 Grades)

FIRST PRIZE
Howard Sherman, Penfield, N. Y.

HONOR AWARDS
Alexander James Bannerman, Dartmouth, Nova Scotia
Charles Quinlan, Jr., Stratford, Conn.
Dana A. Prouty, Filchburg, Mass.
Herbert Main, Marion, Idaho
Thomas A. Smith, Las Cruces, N. Mex.

DIVISION 4
Senior High Schools (10-11-12 Grades)

FIRST PRIZE
Joseph Arnold Williams, Lovejoy, Ill.

HONOR AWARDS
Lawrence Cuba, Chattanooga, Tenn.
David Peyton, Levitown, N. Y.
(2) S. M. Matchmor, Winnipeg, Man.
G. Edwin Shofner, Memphis, Tenn.

DIVISION 5
Technical High Schools, Vocational Schools

FIRST PRIZE
Edward Saks. Philadelphia, Pa.

HONOR AWARDS
Walter E. O'Jay, Hibbing, Minn.
Julio Quinones Velez, Mayaguez, Puerto Rico
Ralph H. Coulson, Bridgeport, Conn.
Austin M. Cressman, Bethlehem, Pa.
Frank E. Kennerly, Charleston, S. C.

DIVISION 6
Technical Institutes, (13-14 Grades)

FIRST PRIZE
G. Edwin Shofner, Memphis, Tenn.

HONOR AWARDS
Frank E. Tisdale, Manchester, N. H.
G. Edwin Shofner, Memphis, Tenn.
Alwin L. Towns, Arlington, Cal.
Paul A. Gilman, Durham, N. H.
Lt. Commander John G. Martin, USMS Kings Point, N. Y.

Special Honorable Mentions: John C. Edelmann, Baltimore, Md.; Ned Peyton, New York, N. Y.; Joseph Evancho, Indianapolis, Ind.; Conrad Gable, Brooklyn, N. Y.

Winners were selected by a panel of judges composed of five outstanding educators, nationally distinguished in the field of Industrial Arts and Vocational Education—

Dr. C. C. Caveny, Dean, Chicago Campus, University of Illinois
Dr. C. H. Groneman, Head, Industrial Education, Texas A & M College
Dr. William W. Theissen, Asst. Superintendent, Milwaukee Public Schools
Hans W. Schmidt, Former Supervisor, School Building Service, State Dept. of Education, Madison, Wisconsin
Gilbert G. Weaver, Director of Training, Bureau of Vocational Curriculum, State Education Dept., New York

Winners announced and prizes awarded concurrently with the A. V. A. Convention, Boston, November-December 1952.

A Contest to Stimulate Planning of More Efficient Layouts for School Shops

In November, 1951, Delta Power Tools announced a School Shop Layout Contest under the title-theme "School Shops for Today and Tomorrow." The contest opened November 1, 1951—closed July 31, 1952.

Its purpose was clear: To stimulate interest in and to generate thinking about modern and more efficient shop layouts—by men most intimately concerned with improved shop efficiency and best qualified to appraise shop needs. The contest was open only to school men—instructors, supervisors and administrators in Industrial Arts, Industrial and Vocational Education, and to graduate and under-graduate students at accredited teacher-training institutions. Winners were to be selected by a panel of five nationally known school authorities.

A. V. A. Indorsement

An instantaneous enthusiastic response greeted the contest announcement; and the A. V. A., keenly interested, arranged for awarding of the prizes at the association's Convention at Boston in November, 1952.

An Authoritative Report on Modern School Shop Plans

In announcing this significant contest, Delta stated its purpose to make a vital contribution to improvement in shop planning, and to assemble all the winning plans in book form as a service to school men throughout the world. These books are now in preparation—reserve your copy immediately. Use the coupon.

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Stanley Nos. 5 and 5¼, and No. 118 planes are recommended especially for school shop use. Fast, clean-cutting action . . . easy adjustments, quality workmanship and balance. Specify Stanley Planes on your next tool requisition, the most for your tool dollar because they last so long. Stanley Tools, Educational Dept., 104 Elm Street, New Britain, Connecticut.

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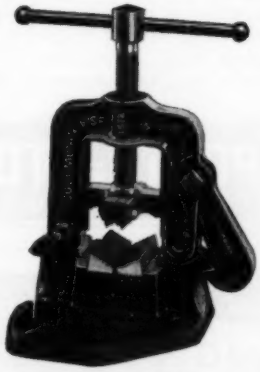

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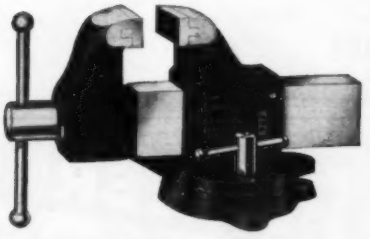

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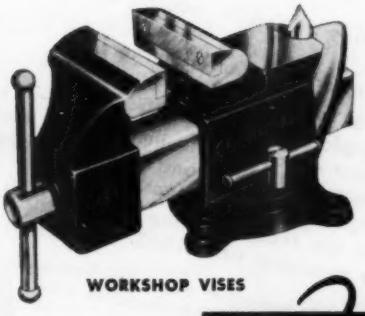

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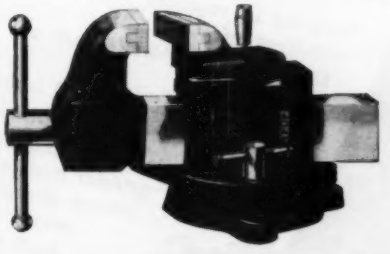

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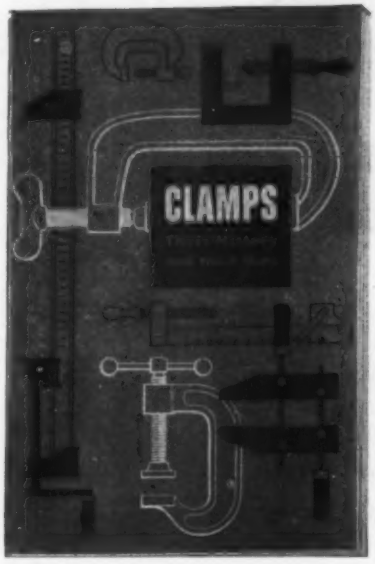

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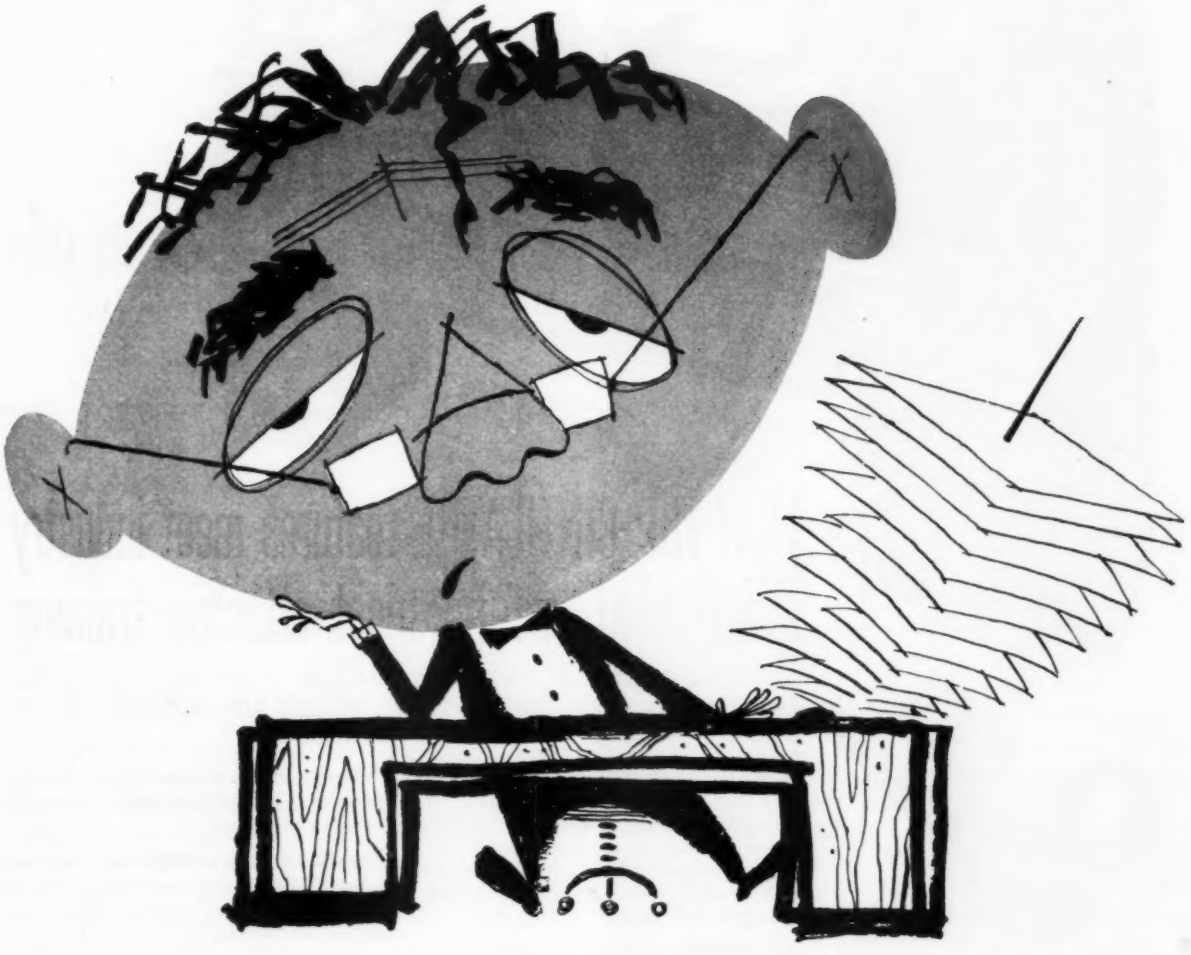

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and more of everything being offered, and more of everything being needed, who wouldn't be blue?
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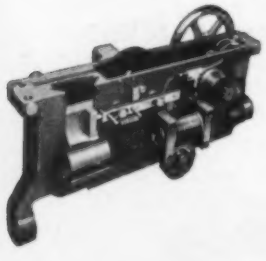
Train your students on the most modern lathe in the field . . . Tray-Top Cintilathes have all the features needed for basic lathe instruction, yet are priced to fit into even modest educational budgets.

(Above) Heat treated forged alloy steel spindles are unusually large. Long tapered key drive is accurate, durable, safe. (Below) One-piece double walled apron contains built-in oil reservoir. Spring-loaded safety clutch prevents overload damage.



ADAPTABLE to a wide range of operations on hard or soft steels, cast irons, non-ferrous metals, with high speed or carbide tools. 12 speeds, all geared, in geometrical progression, 40 to 1 overall ratio. 48 thread and feed changes. Top speeds to 1800 rpm.

EFFICIENT—Simple, direct motor drive, minimum gear contacts, shaved gears, spindles mounted in large anti-friction bearings, effective lubrication throughout.

CONVENIENT—Centralized controls, instant selection of speeds with unique direct-reading "color-match" dial, dual control levers, easy-to-read thread chasing dial, graduated tailstock barrel, "Tray-Tops" for convenient parking of tools, etc.

DURABLE — Anti-friction and Oilite bearings, amply lubricated, integrally splined shafts and spindle of hardened alloy steel, Flamatic hardened gears in headstock, apron, and quick-change gear box, ground bedways, hardened on special order.

SPACE SAVING — With two cabinet legs and "Tray-Tops" for parking tools, the ordinary storage cabinet becomes unnecessary.

SAFE—Drop levers disengage if something accidentally falls on them, long taper key drive spindle (chucks and face plates cannot spin off), electrical equipment fully enclosed, door to electrical panel cannot be removed until disconnect switch is in "off" position. Lathes running on 220 volts have transformer to reduce voltage to 110 volts at push button station or drum switch. "Tray-Tops" keep wrenches, tools, gages off carriage wings and ways, cabinet legs store chucks and face plates away from operator's feet.

SWING SIZES—10", 12½", 15" and 18". Write for catalog T-108.

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INDUSTRIAL ARTS *and* VOCATIONAL EDUCATION

DECEMBER 1952

Industrial Arts in Boston

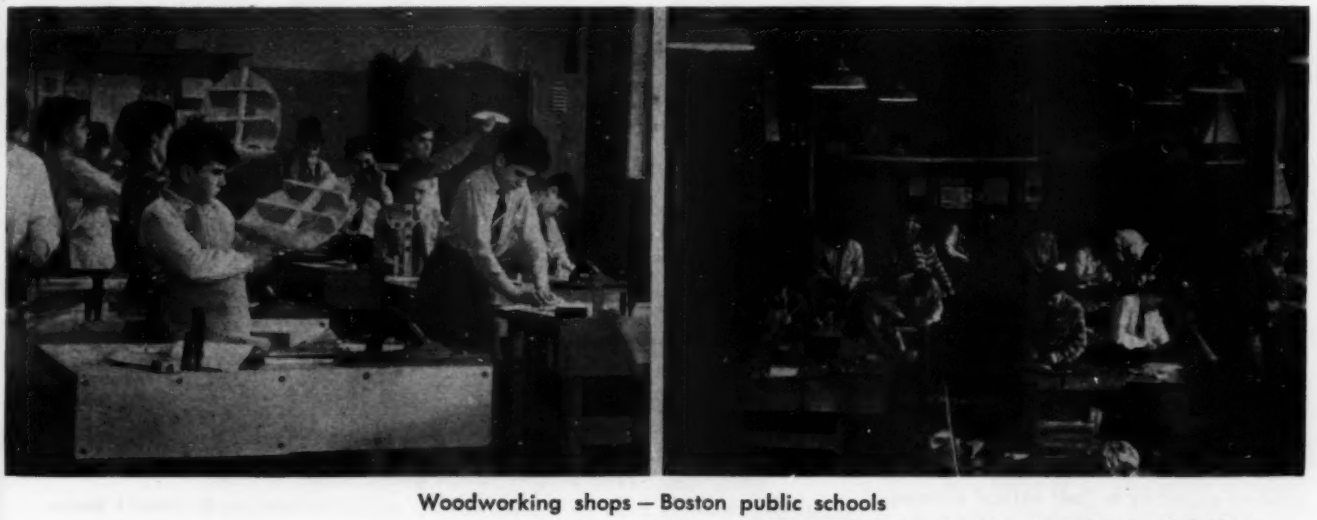
FRANCIS J. EMERY
Director
Department of Industrial Arts
Boston, Mass.

Boston, Mass., is proud to have been the birthplace of industrial-arts work in the schools of the United States. In 1872 the Boston School Committee authorized "industrial schools" but it was not until about 1880 that a class in carpentry for boys was formed. At the end of that school year Mr. Page, the master of the Dwight School where the class had been held, remarked that this instruction is surely in the line of teaching that is to be. This form of instruction was experimental and had many obstacles to overcome. By 1892 a fair start had been made resulting in as many as ten unit shops offering woodworking experiences for a full year. In 1898 this work was known as manual training and had been made a compulsory study for boys in grammar and high schools.

Faneuil Hall
— Photograph, courtesy of Chamber of Commerce, Boston

Frank Leavitt, working with Messrs. Benjamin Eddy and Gustaf Larsson, had formulated a course of study as a result of their having examined the characteristics of the boys of 1880. This instrument was borrowed by other educators in nearby communities and offered as subject matter *in toto*. It was naturally very formal as was other school matter in those days. The exercises were taken in order by all pupils. The better points of the then Swedish Sloyd and the Russian system of teaching handwork to "train the hand and eye" had been amalgamated. This amalgamation and the tailoring of the subject to the characteristics of the pupil were responsible for early successes of this work.

Manual training lost its formality and took on an immense expansion when it went through the stage of *manual arts* to emerge in modern times as *industrial arts*. Boston was in the fore as these changes



Woodworking shops — Boston public schools
— Photographs by Joseph J. Assmus, Patrick T. Campbell School

Sheet-metal shop at left and the electrical shop at right — Boston public school system

— Photographs by Joseph J. Assmus

came about. Indeed, in the councils of the old Boston Manual Training Club, the oldest organization of teachers of shopwork in the United States, many suggestions destined to influence the metamorphosis first came to light. Boston has the tradition that brings to the foreground the need to analyze and weigh an effort, to plan its operation wisely and to be alert to changes which will really mark progress.

There is in Boston today, as a part of the public school system, a department of industrial arts. Shopwork in the schools is a function of this department to develop the pupils in their general education better to understand the scientific — industrial — atomic — age in which he lives and must accommodate himself.

The first of his experiences is in the fourth and fifth grades. There he encounters classroom desk work with paper and cardboard as materials. From a previous free use of similar materials a better control is developed. Creative effort is welcomed. Little fingers produce well such articles as favors, picture mounts, portfolios, cases, memo pads, and boxes of square or rectangular form. Also articles such as Conestoga wagons, houses, igloos, and windmills contribute to class projects in the study of history and geography. Pattern layout is a form of mechanical drawing which these pupils use to determine finished shapes and sizes. Correlation with academic studies is corollary.

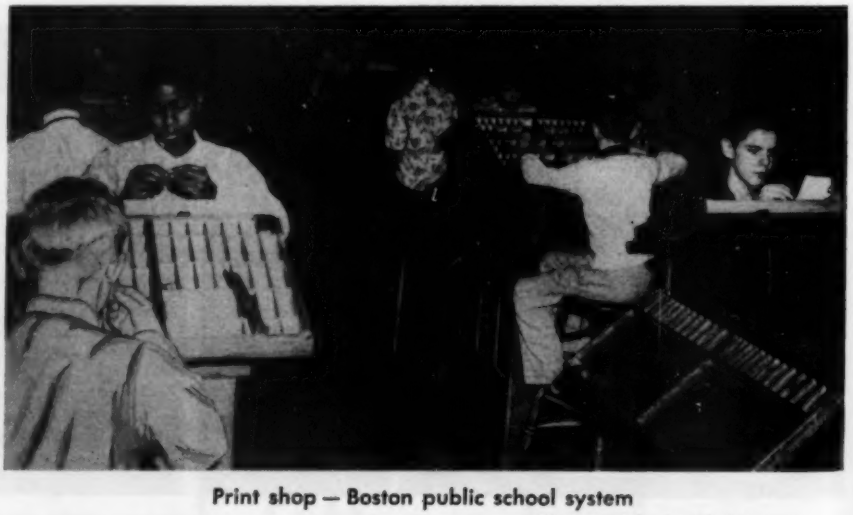
Work in the shops involving wood as a material is first encountered in the sixth grade. This is an introductory course telling of industry. Boys learn the proper name and use of woodworking tools and produce according to their natural abilities. The work is individual and a far cry from the formal exercises of decades ago.

In grades seven and eight of the junior high school a pupil partakes of experiences in other activities such as electricity, machine shop, printing, or a general shop. One half of each school year is spent in learning about a specific shop routine. Four activities which may include woodworking in these grades, though carried on in unit shops, give good orientation. In the ninth grade a pupil may elect a definite shop and spend all his allotted time there.

Pupils desiring industrial arts in the high school grades enroll at East Boston High School, Hyde Park High School, Roslindale High School or South Boston High School. At Roslindale High School there is a large general shop with electrical, printing, sheet-metal, and woodworking departments as well as a drafting room.

Most of the high school work supervised by the industrial-arts department is vocational or terminal education. Classes are organized with the definite aim to fit pupils for profitable employment. Trades taught are automobile repair, electricity, cabinetmaking, upholstery, machine shop, printing, and sheet-metal work. The organization is on the co-operative industrial plan of the Smith-Hughes act. These have proved that an industrial-arts background is advisable preparation for trade training. Actual placement of pupils on the job averages 90 per cent of all possible placements. Boys hold to their work. Many are now in excellent industrial positions. Some have progressed to become proprietors of their own small businesses.

Boston, a city housing many industrial pursuits, also offers an agricultural course.



Print shop — Boston public school system

— Photograph by Joseph J. Assmus

Pupils, boys or girls, attend high school daily studying animal husbandry, market gardening, poultry, dairy, and floriculture. During the summer they are employed on estates or on farms within a radius of fifty miles from Boston. This course is growing.

High school courses mentioned in the foregoing are located in the following schools: Brighton High School, automobile repair; Charlestown High School, electricity; Dorchester High School for Boys, cabinetmaking and upholstery; East Boston High School, machine shop; Hyde Park High School, machine shop; Jamaica Plain High School, agriculture; Roxbury Memorial High (boys), printing; South Boston High School, sheet metal and auto body.

Other adjacent high schools are the Brandeis Vocational High School, the Boston Trade High School for boys, Trade High School for girls, and the Boston Technical High School. All are distinct in nature as the names imply. All are also not too distant from convention headquarters. A visit could easily be made to any one of them during the day from nine o'clock in the morning until two o'clock in the afternoon. There are 22 junior high schools in the city. Those nearest the headquarters and operating on a scale large enough to have at least four shops are the Abraham Lincoln, Mary E. Curley, Patrick T. Campbell, James P. Timilty, and the Clarence R. Edwards. They represent typical installations carrying out representative work. They will also be in session at the same time as the high schools. Directions to reach any of the schools can be obtained at the convention headquarters. The members of the Department of Industrial Arts are looking forward to your visits.

A Tool for Public Relations in Industrial Arts

CHRISTIAN J. HANSEN
Eagle Rock High School
Los Angeles, Calif.

The need in education today is for better relationship between parent and teacher.

Considering the fact that the general public has little understanding of what is taught in industrial arts besides the fundamental tool processes, we at Eagle Rock High School have developed a letter to parents to serve as a tool for the promotion of good public relations.

The original letter was composed around a required project, a salad server, constructed in the seventh-grade woodshop. This letter reads as follows:

EAGLE ROCK HIGH SCHOOL WOODSHOP

June 1, 1951

DEAR PARENT:

Your son has been enrolled in our exploratory woodworking course during the present semester. He has completed a number of projects, one of which is the *salad tong*.

We would like to direct your attention to the procedures involved, the related information presented, and some of the attitudes developed during its construction.

While this list is rather lengthy, many of the items mentioned will carry over into his future woodworking, and other shop experiences.

Procedures Involved

1. Selecting, measuring, and getting out material
2. Learning to trace a pattern and conserve as much material as possible
3. Drilling by hand, and on the drill press
4. Sawing internal and external curves with a coping saw
5. Filing contours
6. Making an accurate joint with a block plane
7. Gluing and clamping
8. Carving spoon bowl, and the effect of grain of the wood in carving
9. Elementary wood turning
10. Sanding, and the idea of starting with coarse sandpaper and decreasing the grade
11. Methods of finishing; filling, mixing filler, brush cleaning, oiling
12. Removing dents in wood with steam

Related Information Presented Directly or Indirectly

1. Making a bill of material
2. Principle of conservation of materials and supplies and its relation to the pupil and the taxes paid by his parents
3. Planning steps of procedure in its construction
4. The principle of speed changes by the use of pulleys
5. Safety consciousness
6. A knowledge of glues and the principle of gluing
7. Spelling words such as: brace, auger bit, coping saw, and the like
8. Composition of a filler
9. Tool care
10. Kinds of wood

Attitudes Developed

1. Patience in construction
2. Co-operation: (a) with superiors, (b) with fellow workers
3. Pride in construction
4. Self-evaluation
5. Appreciation of time and energy involved in construction and the relative value of articles made of wood
6. Good organization of: (a) time, (b)

supplies, (c) tools (a place for everything and everything in its place), (d) class as a whole (Foreman, toolchecker, cleanup system), (e) materials used

7. Respect for the property and time of others
8. The ability to follow instructions

We have attempted to outline here some of the growth which has taken place in your boy during the construction of his salad tongs. A similar but different set of steps could be outlined for his other projects. This particular project has been planned for the above reasons primarily, and secondarily so that he may produce a useful object.

It will be appreciated if you will take a few minutes of your time to fill in the questionnaire at the end of this letter and return it to me by your son.

Sincerely,

CHRISTIAN J. HANSEN
Woodshop Instructor

* * *

Do you use the salad tongs? .....
Do you feel they could be improved? ....
If so, please give your criticisms. .....
Is the type of finish used satisfactory? ...
If not, do you have any suggestions? ....
Do you have any suggestion for other useful projects which could be made in the woodshop? .....
Comments: .....

Signature of Parent

The letter has another purpose, through the returned questionnaire, of indicating to the instructor the practical value of the project. It also helps determine needs of individual students that parents might draw from the students and which might otherwise escape the instructor's attention.

Purpose of the Questionnaire

The questionnaire has two very definite purposes: (1) It enables the instructor to check the quality of his instruction, and (2) It is an assurance that the letters are received and read by the parents.

The questionnaire, as returned by 66 students in one semester, broke down with the following results.

In answer to the first question, "Do you use the salad tongs?" 48 answered yes; three answered no, one of which was lost; two said, occasionally; two were saving them for keepsakes; one was given away; five answered no, but intended to use them; two were being used as beaters or mixers; three were not finished, but the parents stated that they would be used when finished.

To the second question, "Do you feel they could be improved?" 21 answered yes; 32, no; three were in doubt, and ten were not answered.

On, "If so, please give your criticisms" 18 stated that the server was too large; one wished to be able to separate the two parts; one wanted the bowls mounted at a greater angle; and the remaining had no comment.

The fourth question was asked because the instructor was not satisfied with an oil finish. "Is the type of finish used satisfactory?" was answered — 48, yes; seven, no; and one was in doubt.

"If not, do you have any suggestions?" In answer to this, four suggested a varnish finish, one shellac, one suggested a less porous wood, and one was in doubt. Although not many requested a change in the finish, it has been changed to a rubbed spar varnish.

In answer to the sixth question there were a number of good projects suggested, such as, a salad bowl to go with the server, and a spaghetti server. There were numerous requests for the usual lamps, boxes, magazine racks, tie racks, and the like.

The comments ending the questionnaire were unusually helpful and inspiring, and have very definitely led to the improvement of the woodwork program at Eagle Rock High School. A few of them follow:

From the mother of a boy who we thought did rather poorly — "Anything made by hand — wood, metal, and the like, is a personal satisfaction for the person making it. And regardless of perfection or price, when given to me becomes priceless."

From a father who is also a woodwork teacher, "Your idea of sending home a job analysis is an excellent idea for selling the shop program to the parents."

From a parent of a boy who later won a regional prize for his salad server in the Industrial Arts Award Program sponsored by the Ford Motor Company, "I feel that my boy has gained a new interest and considerable knowledge for such a short period of instruction in woodworking."

From the parent of a boy with a partially crippled hand, "For our son to say that he enjoyed the shops most of all this first year in Junior High was a delightful surprise. His handicap of the left hand didn't seem to matter, or else he learned

Photography class
— Photograph submitted by Robert D. Helsby, industrial-arts instructor, State Teachers College, Oswego, N. Y.

how to overcome it and to be more patient. May I comment further? This is a splendid report and we are happy to have it."

One parent criticized our program as follows: "The uses of the steel square, compass, and spirit level as well as the 'plumb bob' should be emphasized," and he suggested making "small magazine racks, tie racks, and small boxes. Any of the above would give students an opportunity to make level and square joints, dowel joints, and an excellent opportunity to practice finishing in varnish and rubbed shellac."

And last, "What and why is the charge for materials?" has led to the following letter.

EAGLE ROCK HIGH SCHOOL WOODSHOP
December 12, 1951

DEAR PARENT:

As you know, your son is enrolled in a course in woodworking. During this course he will be required to construct a number of projects. There have been several questions about the fees charged for these projects. Hence, this letter of explanation.

Your boy will make the following projects: a book end costing 10 cents; a salad set at 30 cents; a leaf tray at 35 cents; and if highly proficient will be allowed to make a project of his own choice, the cost of which will vary depending on its size. He will be charged extra for spoilage.

The lumber for the above projects is bought in quantity from a local hardwood lumber company with student body funds, and stored in our woodshop lumber room. It is sold to the student who is required to compute the size and cost of the material he uses. His estimate is then checked by the instructor.

Your boy is charged only for the lumber he uses. All other supplies, such as nails, screws, glue, stains, shellac, varnish, sandpaper, coping saw blades, wax, steel wool, and paint, are supplied by the Los Angeles City Board of Education through your taxes. These taxes also pay for all the tools and equipment used by your son in the woodshop.

If a boy is financially unable to buy the lumber he needs, arrangements are made to provide it for him.

Bills are payable at any time during the semester, and must be paid before the completion of the course.

We hope this letter will explain your boy's financial responsibility in this course, and we would appreciate it if you would fill in and return the following questionnaire.

Sincerely,
CHRISTIAN J. HANSEN
Woodshop Instructor

* * *

1. Do you have any questions concerning woodworking finances? .....
2. Comments: .....

Signature of Parent

Although the first letter mentioned in the foregoing pertains only to a woodwork project, the idea is easily adaptable to any type of shop or to any other class.

To summarize, the letter and questionnaire have led to changes in the shop program, in the project considered, in the instructor's thinking, and, by analyzing the parental comments, has strengthened the program in the eyes of the parents.

Over-All Requirements For Industrial-Arts Teacher Education

GUSTAVE S. WALL
Brainard, Minn.

Among the many questions that may well be asked about industrial-arts teacher education, one which asks: "How should the course requirements be divided among the three major areas — *general, professional,* and *shop*" is worthy of consideration. An answer expressive of the beliefs held by 492 industrial teacher educators as well as the practice followed in 109 institutions was obtained in a study completed by the writer.[1]

Before presenting the facts concerning the practices and beliefs, it is desirable that some description be given about the institutions, the respondents, and the instruments utilized in the normative survey conducted to gather the data.

The Instruments

Very briefly, then, a check sheet asking the industrial-teacher educators to express their beliefs relative to 22 major items was prepared and forwarded to such individuals throughout the nation. There were 492 of these returned, hence, the base number of opinions given represents an average of slightly less than four for each institution represented as they came from 128 institutions. In reality, the number of responses received from an institution ranged from one up to twenty.

A supplementary sheet, to be completed by the department head, was prepared to parallel the questions on the check sheet permitting the reporting of the practice carried on. A total of 109 usable supplementary sheets were returned. These represented institutions in 41 states. Only one state, therefore, contributed opinions but no practice, for the responses came from 42 states. However, beliefs presented on the check sheet came from 128 institutions as already mentioned; hence, 19 institutions from which opinions were received do not have their practice reported.

The Institutions

Of the 128 institutions from which either or both forms were received, 117 are publicly controlled, one is jointly controlled by public and private agencies, and the remaining ten are private in control.

[1]Gustave S. Wall, "Dual-Purpose Industrial Education at the College Level," Ph.D. thesis, University of Minnesota, 1951, 263 pp.

Only one of these institutions does not offer, at least, the first degree. Almost one half (52) grant only the baccalaureate degree; 45 offer work leading to the master's degree; and 30 afford the opportunity to earn the doctorate. As to classification, the institutions ranged from "liberal arts and general," of which there were three; through "primarily teacher preparatory" (31) and "both liberal arts and general, and teacher preparatory" (29); to those (37) which provide "liberal arts and general with three or more professional schools." The remainder were spread among five other classifications given in the *Education Directory — Higher Education*.[2]

The Respondents

Most of the teacher educators represented possess a graduate degree, for only about 15 per cent hold only a bachelor's degree or no degree at all. The bulk of them, 355 teacher educators, have the master's degree and 60 had earned a doctor's degree.

It is interesting to note, at this point, that 354 of the total were concerned with industrial-arts teacher preparation only; 107 were in positions in which their work dealt with both industrial arts and vocational-industrial teacher education; and only 31 were concerned solely with vocational-industrial teacher preparation.

That which follows, then, will represent the practice as reported by 109 institutions spread throughout 41 states, and the beliefs expressed by 492 individuals scattered in varying numbers among 128 teacher education centers. It deals only with the over-all requirements in industrial-arts teacher education and does not presume to give details concerning the specific courses.

The Over-All Requirements

Distribution by Areas: The opinion expressed by the respondent virtually assigns equal emphasis to the three major areas — *general, professional,* and *shop.* This does not agree with the practice reported, which reveals that approximately 42, 27, and 31 per cent respectively are assigned to the major areas mentioned. These differences are shown more clearly in Table I.

For purposes of this study, *General* refers to that course work which is concerned primarily with the over-all development of the student as a member of our society. This may be referred to by some as cultural, liberal, or academic. *Professional* is used to include that course work which is primarily concerned with the development of the student as a teacher. It may be referred to as education or pedagogy. It includes over-all, general teacher preparation course work, and also that which is concerned with teaching industrial subjects. *Shop,* as used here, includes both shop and drawing work as it is commonly conceived as being representative of the curriculum area known as industrial arts. This may also be referred to as simply shopwork, laboratory, technical, and drawing.

It will be noted in Table I (and the others which follow) that a third column headed *Jury* is included. This presents the opinion reaction of the 60 holders of the doctor's degree. These are included in the *Opinion* column; hence, that column would be changed slightly if the *Jury* members were eliminated from it. The mean percentages given for each area were in response to a question which asked for the percentage of the total credits, exclusive of military and physical education required for graduation under the industrial-arts curriculum.

TABLE I. Mean Percentage Distribution of Credits in Industrial-Arts Teacher Education

	Group Opinion	*Practice*	*Jury Opinion*
General	33.24	42.23	34.66
Professional	33.85	26.81	32.95
Shop	32.89	30.94	32.33

It is reasonable to conclude from the opinion expressed that the amount of emphasis on *general* course work should be reduced from the reported practice largely by assigning more credit to be earned in both *professional* and *shop* course work. This increase should be brought about chiefly by increasing the amount of *professional* course work by slightly more than 7 per cent over the present practice; the *shop* to be increased only about 2 per cent over the practice reported.

The *professional* development reported in Table I was determined by the respondents expressing opinions and reporting the practice separately with regard to: (*a*) that which deals only with teaching the special work of the major, and (*b*) pedagogy or education course work of a general nature. However, the fact that designation into the two classifications is not clearly defined, the sum total of both is presented. This problem of classification becomes obvious if one thinks of "student teaching" which may be classified in both categories.

Solely for its interest value, most of this gain was brought about by the respondents expressing that the *industrial professional* should take up 14.35 per cent of the total requirement. This is almost 5 per cent over that reported as being the practice (9.58 per cent). The range in this aspect was from only 2 per cent up to 40 per cent of the total requirement. The remainder of the gain was brought about by the industrial teacher educators favoring about a 2 per cent increase over the practice of 17.23 per cent, raising the total requirement for other *professional* course work to 19.50 per cent. The range for this aspect spread from 5 per cent to 35 per cent.

On the foregoing basis, it may be reasonable to conclude that the industrial-teacher educators believe they should have a direct contact with their majors through almost one half of the total course requirements; the *shop* calling for 32.89 per cent which added to the 14.35 per cent for *industrial professional* makes a total of 47.24 per cent. The *Jury* response pattern was almost the same as that of the whole group on this matter.

It should be borne in mind, however, that the reduction shown for *general* development is not quite as great as that given, for military and health education courses which are generally classified in this area are not included. The effect of this addition, obviously, would be an increase in the *general* by about eight semester credits which were not included in the foregoing tabulation, which was based on 120 semester credits. Thus *general* development would call for about 48 semester hours out of 128 rather than 40 out of a total of 120. Also, it may well be that industrial-teacher educators feel justified in their recommendation because industrial-arts shop and drawing course work has in itself a measure of *general* development value — this because its objectives stress *general* development.

In any event it is reasonable to conclude that industrial-teacher educators are in favor of giving potential industrial-arts teachers more *professional* development

[2] *Education Directory — Higher Education, 1949–50* (Washington: U. S. Office of Education, 1949), 174 pp.

than is presently required and only slightly more *shop* course work than is now required.

From the interest point of view, the opinions with regard to the *shop* requirement ranged from a high demand that 65 per cent of the total be required down to a low of only 10 per cent. In practice the amount required ranged from 10 per cent up to 47 per cent. Thus, no one favored dropping below the present demand for *shop* preparation.

Amount of Total Requirement

That some of the changes expressed may be accounted for by differences in the curriculum requirements among the several departments found in a college of education may be concluded from the responses given to other questions. Over 36 per cent of the respondents would require a greater total number of credits for graduation under the industrial-arts curriculum. It may be assumed that some of this increase would serve in permitting the increase in *professional* development reported. The opinion reactions and the practices reported in response to the question of how the total number of credits required for graduation under the industrial-arts curriculum should compare with that for other departments in education is presented in Table II.

TABLE II. Total Percentage Credit Requirement of Industrial Arts Majors as Compared With Others

	Group Opinion	*Practice*	*Jury Opinion*
More	36.12	31.68	20.00
Same	63.67	68.31	80.00
Less	0.20	0.00	0.00

The change, as noted above, is evidence that a sizable minority is in favor of an increase in the total requirement. Even the lower figure represented by the *Jury* shows one fifth of them favoring such an increase. In any event, over one third of the group as a whole favors an increased total requirement of industrial-arts teacher education students. Only one individual held the opinion that the total should be less for industrial-arts majors.

It should be noted, however, that the percentage of the group favoring a greater requirement represents only about a 5 per cent gain over the practice reported. With the *Jury* the opposite reaction is the case, for 80 per cent of them would favor the same total requirement of industrial-arts majors as of others.

The General Requirement

As might be surmised, the response, to the question of how the amount of general course work required of industrial-arts majors should compare with others, reveals that over one eighth of the respondents would favor a decrease. These facts as to opinion and practice are shown in Table III.

TABLE III. General Percentage Requirements of Industrial Arts Majors as Compared With Others

	Group Opinion	*Practice*	*Jury Opinion*
More	4.13	8.91	1.66
Same	83.64	84.15	85.00
Less	13.22	6.93	13.33

It should be noted that although the number favoring reduction of the *general* requirement for industrial-arts trainees is relatively small, it does represent percentagewise almost double the percentage of institutions which follow such a practice. Stating it another way, most industrial-teacher educators believe in maintaining the *status quo* with regard to the *general* development; but, enough of them believe such a requirement should be reduced as to cause one to give such a minority some recognition. This should be considered together with the reaction to the spread among the three areas by the group as reported in Table I, in which it will be recalled the group, as a whole, favored reducing the *general* requirement practice reported by almost one fourth.

Conclusion

Concluding with a brief recapitulation, it is reasonable to state that revision of industrial-arts teacher education curriculums should strive toward equalizing the requirement for each of the three major areas — *general, professional,* and *shop;* that industrial-arts teacher educators believe in maintaining the *status quo* with regard to the total number of credits required for graduation; and that the amount of *general* development should be approximately the same for all majors.

An Analysis of Girls Taking Graphic Arts

JACOB A. NOLFO
Cold Spring, N. Y.

When I began my teaching career, I was placed in charge of a graphic-arts shop in a junior high school. Much to my surprise, my first class consisted of 24 ninth-grade girls. I couldn't visualize just how girls would be interested in a graphic-arts shop — surely not in typesetting or handling of ink. I proposed to start them all in block engraving and dry point etching. After the demonstrations most of the girls began their projects, but a few expressed a desire to print their name cards. For a few moments my explanation of all that typesetting entailed made them hesitant, but their persistence led into a series of demonstrations on typesetting. The learning process was very slow and I had to be constantly supervising them, so much so at times that I neglected those in other areas. One case of type was spilled, twice a composing stick was dropped, but slowly and steadily they set their names, addresses, and telephone numbers. Most of the girls would have nothing to do with printing until the first girl printed her card in a bright trumpet red. Then the rush was on. They all wanted to drop what they were doing and set type. Eventually everyone took a turn at it. Since there was room for only eight to ten girls in the composing and press areas, the other girls kept at their linoleum carving and dry point etching. I then introduced marbleized paper which was a failure because the girls could not stand the gasoline and ink on their hands, and the delicate skin of most of them became easily red-

Here are the girls working on the name cards. An illustration of developing desirable social relationships

dened. Although I presented to them all the possibilities of marbleized paper, they did not develop any interest whatsoever.

Another project we undertook was the binding of small notebooks, autograph books, and the like, but the interest reached a low ebb when they began getting glue on their hands and clothes.

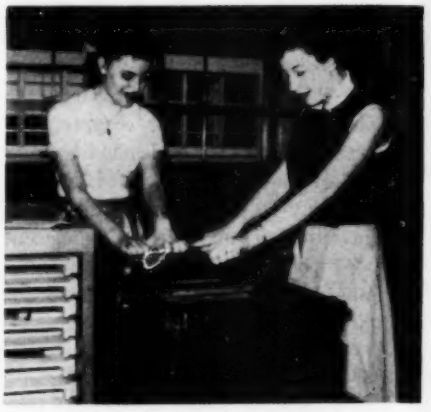
In dry point etching and block carving there was not much interest until a proof of the initial project was obtained. From that point ideas came fast and furious for another such project, but the obstacle to the girls' progress was their failure to realize the limitations of such work, which left the girls disappointed with the results. Some of the girls heeded my advice of keeping the project simple but a few thought they could create a project that resembled a four- or five-color cut in a magazine. In dry point etching the girls seem to enjoy etching a photograph of their favorite crooner or actor rather than scenery which seems to be a favorite with the boys. Although dry point etching requires working with ink, evidently the interest promoted by the final product surpassed the girls' dislike to experiment with ink.

As I mentioned before the girls' biggest thrill took place when they printed their first card on the pilot platen press. With brightened face each student rushed about showing her friends what she had accomplished. However, before each job was printed the girls were very impatient and each wanted to have her job done first. The only factor about typesetting that troubled me was the distribution of the type. I knew it would be difficult for the girls to hold their work in the left hand and distribute with the right so I had them place their work (set at 15 picas) in a lead and slug compartment in the vertically inclined lead and slug rack atop the composing bank. From here they drew one word at a time and did a good clean job of distribution. I always had a large chart of the California Job Case near them so they would know where to deposit the individual type characters. There was quite a bit of trouble with justification of lines, even after repeated individual demonstrations, for they could not visualize why the line had to be tight. When one of the girls pied her job because it was not justified, an explanation of the cause of the mishap made others take greater pains with their justification.

One of the girls was going to have a birthday party so I suggested that she print something on napkins for it. She did a nice job so most of the girls tried that, too. We then printed personalized stationery with the same type used for the name card and finally concluded by printing memo pads for their parents. A few of the girls combined linolem carving with typesetting but the hindrance here was that the girls doing the work on the linoleum would finish much sooner than the girls setting type. In this case I had those girls help the others set type.

The final area that I experimented with was silk screen and the results were these: Girls take great interest in making the drawing, cutting the stencil, and dissolving the stencil on the screen, but when the ink is placed on the screen they handle the work as if it were a red-hot poker. They

A group of girls carving out their linoleum blocks



Taking proofs of their linoleum blocks

just don't like the dirty work, except for an occasional ninth grader, who as yet has not realized that another sex exists. They are fascinated by results but as mentioned before, detest cleaning up. This must be the factor or at least a major factor that keeps girls away from industrial-arts shops when they are allowed to choose it as an elective.

Evaluating the disadvantages of girls in this activity, I find in my case that the class is too large to allow enough individual instruction which they sorely need as they begin work in each area of the shop; an ideal group would be not more than 15 girls. The second advantage is that most jobs in the graphic-arts shop are not exactly clean, what with ink, glue, gasoline, and dirty rags, and when usually the girls come in with very clean and valuable clothes, even an apron will not prevent a stain at times.

Evaluating the advantages of having girls in graphic arts I find that (1) they seem to take their time about everything they do and do it correctly, more so than many of the boys their own age and of their own intelligence; (2) their personnel system functions effectively and the shop is spic and span when they leave. The boys will do a fairly good job of cleaning up, but have to be closely supervised, which is not the case with that group of girls; (3) they are prolific in their ideas for projects, much more than boys, espevially in linoleum carving and celluloid etching; and (4) they work as a group much better than boys do — there is less quarreling, and fewer excuses are made to get out of work. I find that by not setting up a required project, the results are more satisfying in that a happier mood is cre-

ated where almost all discipline problems are eliminated.

What did the girls get out of the course? By handling type, ink, presses, they obtained an idea of how books, papers, and the like are printed. A number of the girls liked dry point and block engraving so much that they did extra work at home in that area. By doing that they obtained an idea as to how commercial engravings were made. Bookbinding taught them how, in general, most books were bound. They, therefore, obtained information and experiences in the basic processes of graphic arts, developed avocational activities in that particular area, developed creative expression in planning projects in the dry point, block engraving, and silk screen areas, and their co-operation and tolerance for each other demonstrated that they were developing desirable social relationships, these being four major objectives of industrial arts that the class achieved. I sincerely feel that the course had an intrinsic value to the students in their general-education experiences which could not have been obtained anywhere else.

A Basic Glossary and Vocabulary in Printing

ERNST H. SUERKEN
Supervising Principal
Union Free School District, Greenburgh
Number Eleven
Dobbs Ferry, N. Y.

(Continued from page 307 of the November, 1952, issue)

HALF TITLE: The general title of a book printed on a leaf separating the preliminary matter from the text. Half titles are also used throughout a book to separate principal parts, carrying the names of the following portion.

HALF TONE: An engraved plate made of copper or zinc on which the gradation of tone is reproduced by dots caused by interposing a screen between the camera and the copy. The name is derived from the fact that the process was the first to reproduce successfully the half tones of the photograph.

I

illustration
imperative sentence
imperfect
imposing stone
imprint
indention
index
inferior figure
ink slab
inverted comma
inverted letter
insert
insert space
italic
interchangeability
interrogation mark
interrogative sentence
initial letter
interspacing
invitation

(Straight Composition)

indentions
half diamond
hanging
regular
square

IMPOSING STONE: The surface on which compositors impose type and lock it up in chases preparatory to printing. It formerly was a large flat stone surface, but now is usually made of metal. Also called imposing table.

IMPOSITION: The operation of arranging printing matter so that when the printed sheet is folded, the pages or parts will follow in correct sequence and with proper margins.

IMPRINT: The name or trade-mark of a printer or publisher placed inconspicuously on the title page, or on the last page of the text if there is no title page. Sometimes the date and place of issue are also included.

INCUNABULA: A Latin term meaning "cradle period or state." Especially applied to books printed before the year A.D. 1500, or during the infancy of printing.

INDEX: A list placed at the end of a book, showing individual items from the contents in alphabetical order.

INFERIOR: A small letter or figure cast on the lower part of the type partly below the line of the regular face, used for reference marks, quotations, formulas, and the like.

INTERTYPE: Trade name of a slug-casting machine, especially adapted to the composition of display lines, borders, and the like.

INTRODUCTION: By dictionary definition "That part of a book, discourses, and the like, introducing the main subject or part." It differs from the foreword and the preface in that it is considered the initial part of the text and immediately precedes it. In actual practice, the purpose, subject matter, and length of the introduction show great variations.

ITALIC: Type faces which slant to the right, in contrast to the upright verticals of Roman faces. Italic type was first designed by Aldus Manutius, of Venice, Italy, and used by him to print an edition of Virgil in 1501.

J

job case
font
matter
ticket
type
journeyman
justification
justify

(Straight Composition)

justifier

JENSON: Nicholas, a famous Venetian printer of the fifteenth century, produced the first true Roman oldstyle type face in 1470. The type face known as Jenson oldstyle, which was modeled after the Roman letters of Jenson, was produced by William Morris in England, about 1890.

JOURNEYMAN: A compositor, pressman, or bookbinder who has served his apprenticeship and is recognized as a full-fledged workman.

JUSTIFICATION: The process of adjusting spaces between type in order to equalize the white space between words, while producing lines of equal length to facilitate solid lockup.

K

keep down
keep up
kerned letter
knee

KERN: A projecting portion of a type face which extends beyond the body or shank, overlapping on to other type.

L

labor organization
labor saving
laying cases
layout
lead and rule cutter
lead
leaded matter
leader line
leaders
lead rack
leads
lean matter
left fist
less space
let it stand
letter
  bold
  condensed
  defective
  kerned
  sloping
  swash
  tall
  troublesome
  turned
letterpress
letter spacing
lifting line
ligature
light element
light face
line
  break
  centered
  diagonal
  display
  guide
  lifting
  light
  loose
line gauge
linotype
linotype machinist
linotype operator
lithography
live job
local style
logotype
loose line
loose punctuation
lower case
Ludlow
lye

(Straight Composition)

leaders
letterspacing
lined up
long primer

LAY OF THE CASE: The arrangement of type characters in individual compartments of a type case.

LAYOUT: A preliminary arrangement or sketch of a piece of printing to be used by the compositor as a guide in the selection of the kind and size of type and the grouping of the printing matter. An elaborate plan of a piece of printing, sometimes in color, designed to influence prospective customers. A thumbnail sketch, usually in pencil, submitted for comparison with others.

LEADS: Strips of lead of varying length, not more than four points thick and less than type high, used to adjust the spaces between type lines. Two-point leads are the most commonly used. Sometimes made of other metals.

LEGEND: A brief description printed below illustrations, maps, tables, and the like. Also called captions.

LIGATURE: Two or more characters cast on the same type shank.

LINE CUT: An etched plate on which the line or solid effects are produced by lines of varying width engraved or zinc or other similar material, also called line etching and zinc etching.

LINE GAUGE: A graduated rule marked off in pica and nonpareil measurements on one edge, sometimes also showing other type sizes and the inch scale.

LINOTYPE: Trade name of a composing machine by Ottmar Mergenthaler about 1885. This is a slug-casting machine which assembles and casts a "line-o'-type" on a metal slug from which printing may be done. The matrices from which the slug is cast may be used over and over again.

LITHOGRAPHY: From *lithos*, a stone, and *graphein*, to write. The process based on the antipathy of water and grease, of putting writing or designs on stone and producing printed impressions therefrom. Also applied to any process based on the same principle, but using zinc, aluminum, or other medium instead of stone, such as the offset printing process.

LIVE: A term used to indicate type which has not been run or which may be used again.

LOCKUP: The operation of tightening and fastening a type form in a chase by means of quoins and other devices to prepare it for the press.

LOWER CASE: The lower of a pair of news cases, in which the small letters of the alphabet are assigned to individual compartments; hence, these letters are called lower-case letters.

LUDLOW TYPOGRAPH: Trade name for a slug-casting machine which is especially adapted to the composition of display lines, borders, and the like.

M

machine composition
made up
mailing room
make paragraph
make-up man
make-up rule
mallet
manuscript
marks
  proofreader's
  punctuation
  reference
mass
materials
matter
  body
  composed
  dead
  fat
  index
  job
  leaded
  lean
  live
  open
  solid
  standing
  straight
  tabular
measure
measurements
medium
metal furniture
M.F. Book
micrometer
miter
mitering
modern
modernistic
monosyllable
Monotype
  caster
  operator
mortise
movable type
move over
multiple
mutton quad

(Straight Composition)

machine cast border
marginal initial
mitered
mitered corner
mitering machine

MAKE-UP: The arrangement of type or other printing surfaces into pages of columns preparatory to printing.

MALLET: A wooden hammer with a short handle, used with type planers to plane down forms. Also used with proof planers in pulling stone proofs.

MO: A latin suffix to certain numerals to indicate the number of leaves made by folding a sheet of paper, such as 12mo, 16mo, 32mo, and so forth.

MODERN: Type faces having straight serifs, heavy downstrokes, and thin hairlines, in contrast with oldstyle faces.

MONOTYPE: Trade name of a composing machine invented by Tolbert Lanston about 1887 and put into commercial use a few years later. The Monotype sets and casts individual pieces of type in justified lines. It consists of two separate units, a keyboard and a caster.

MONOTYPE UNIT SYSTEM: The system of measurement used by the Monotype machine. The setwise dimensions of all type characters in a font have a fixed relationship to the em, their measurements being expressed in Monotype units, which are one-eighteenth em wide.

N

neck
nick
nondistribution
nonpareil
nut quad
no paragraph

(Straight Composition)

nomenclature

NECK: The sloping part between the face and the shoulder of a type character. Also called beard.

NEW ODD PAGE: A right-hand or odd numbered page on which separate features or sections of a book or pamphlet are begun, such as the table of contents, title page, new chapters or units, index, and the like.

NEWS CASE: The type case in most common use. News cases come in pairs, upper and lower.

NEWSPRINT: A soft-sized paper made principally from wood pulp, and used mostly for newspapers, circulars, and the cheaper grades of printing where permanence is not required.

NICK: A crosswise groove in the shank of a piece of type, which indicates by sight and touch the position in which the type should be placed in the composing stick. The nick also aids in distinguishing fonts of type.

NONPAREIL: Formerly the name of a size of type which is now known as 6-point. A unit of measurement in type equal to 6 points or one-twelfth of an inch.

O

occupational hazard
odd size
office corrections
office style
off its feet
O.K. with corr.
oldstyle
open matter
open punctuation
original

original copy
ornament
outs
out-see-copy
over display
overhand
overlap
overrunning

(Straight Composition)

one point side-face rule
open leader
ornament

OCTAVO: A sheet of paper folded three times to make eight leaves or sixteen pages of approximately 6 by 9 inches. Often abbreviated to 8vo. In the Government Printing Office, the size known as octavo is 5⅞ by 9⅛ inches.

OFFSET PRINTING: An adaptation of stone lithography in which the design is drawn or photographically reproduced on a thin metal plate or other medium from which it is transferred to the paper to be printed.

OLDSTYLE: Type faces characterized by oblique serifs and not much contrast between heavy and light elements.

OPTICAL CENTER: The center on a printed page as it appears to the eyes, being slightly above the actual or mathematical center.

P

page
page form
page proof
paragraph
parallel mark
paren
parenthesis
period
phrase
pi
pica
pica em
pica rule
picking for sorts
pick up
pin mark
pins (stick)
plane down
planer
plugging
poetry
primary
print
printed copy
point
point line
point set
point system
prefix
production
progress chart
proof
  marks
  paper
  planer
  press
  puller
proofs
  author's
  corrected
  dirty
  first
  final
  foul
  galley
  page
  press
  pulling
  revised
proofed
proofing
proofreader
proofroom
proper noun
pull out
pulling proof
punch down space
punching
punctuation

(Straight Composition)

paragraph indention
period leaders

PAGE PROOFS: Proof taken after the composed type matter has been made into pages.

PERFORATING RULE: *See* Rule.

PHOTOENGRAVING: Any photomechanical process for reproducing designs in which the printing surface is in relief.

PI; PIE: Type confusedly mixed and jumbled.

PICA: The standard of type measurement in the point system, equal to 12 points or about one sixth of an inch. Formerly the name of a size of type now known as 12-point.

PIN MARK: A circular indentation in the side of the type body made by the pin in the mold which casts the type.

PLANER: A block of wood having a smooth surface, which when placed on top of composed matter and tapped gently, levels the type. Also known as a type planer. A proof planer is similar, but in addition has its smooth surface covered with a layer of thick cloth. It is used when stone proofs are being pulled.

PLATEN: A flat metal plate which presses the paper against the form on a platen press to produce an impression.

PLATEN PRESS: A printing press on which the impression is made by compression of a flat platen on the paper.

PLY: One of the thicknesses or layers pasted together to make a sheet of paper or cardboard, as two-ply or three-ply card stock, and the like.

POINT: The unit upon which the point system of measuring type is based. A point is nearly 1/72 of an inch — 0.013837 inch.

POINT SYSTEM: A system of measuring type introduced in France by Fournier and modified by Didot in the eighteenth century. The Didot system is still standard in continental European countries. The point system now in use in the United States and Great Britain is a modification based upon the pica body, which is divided into twelve points and every type or size consists of a given number of points.

PREFACE: Preliminary material of a book containing the personal remarks of the author.

PRESS PROOF: A proof taken on a press after the form has been made ready for the press run. Its purpose is to show the margins, imposition, and general appearance of a precise piece of printing, as well as to give opportunity for a final check on corrections.

PROOF: A trial impression of any printing surface taken for the purpose of examination and correction of errors.

PROOF PLANER: *See* Planer.

PROOF PRESS: A press used primarily for taking proofs for correction.

PROOFREADER: One who reads proof and marks typographical and other errors for correction.

PROOFREADER'S MARKS: Standard marks used by proofreaders to indicate on proofs the corrections to be made in the type matter.

PROPERTY NUMBER: A number assigned by the Government Printing Office to designate the kind, grade, color, weight, size, and lot number of any specific paper stock.

Q

quad
quadding out
query
quoin
quotation
quotation mark
quotation quads
quotes

(Straight Composition)

Quarter size case

QUAD: A block of metal less than type high, used for indentions, to space out lines, and to fill out space at the end of paragraphs; cast in multiples of ems. Abbreviated form of the word quadrant.

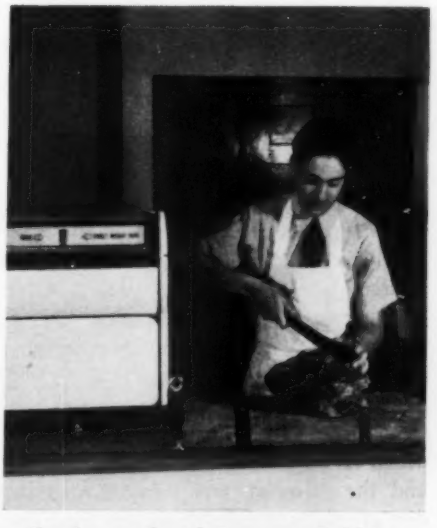
QUARTO: A book size established by folding a sheet into four leaves or eight pages of about 9½ by 12 inches. In the Government Printing Office the size known as quarto is 9⅛ by 11⅜ inches, often abbreviated to 4to.

QUOIN KEY: A turning device which fits into and tightens quoins to lock type forms.

QUOINS: Small metal wedge-shaped devices used to fasten type forms securely in a chase. They are tightened by means of quoinkeys.

(To be continued)

A new world's record for fast oil-well drilling was set by a drill crew in South Louisiana recently, when 2575 feet of hole were made in a regular eight-hour tour, or an average depth of 322 feet an hour. Oil industry research in drilling techniques is responsible for such reductions in drilling time. The results are savings in production costs, which are passed on to the consumer in the form of reasonable prices for oil products. — *Petroleum Newsnotes*, American Petroleum Institute, New York City.



Food merchandising at Dobbins Vocational-Technical School, Philadelphia, Pa.

— Photograph submitted by Benjamin Novak

Industrial Arts and Vocational Education

John J. Metz, *Editor*

BOSTON OUR NEXT OBJECTIVE

Teachers of industrial arts and vocational education who do not go to Boston for the coming American Vocational Association convention are missing a wonderful opportunity. To miss meeting one's fellow teachers at this great annual meeting of the teachers of practical subjects is bad enough in itself. To miss going to Boston, the birthplace of manual training in the schools of our country, however, is probably worse.

It was here that interested men started *The Whittling School* in 1871, where brackets, small chests, and match boxes were made by the boys. Three years later another school was opened. After two more years the two schools united and then a classroom came into being which was similar to our present-day school shops, with benches equipped with vises, and drawers with locks and keys, cotton aprons for the students (called scholars at that time), and tools consisting of a flat chisel, a gouge, and a veining tool.

That was the humble beginning of our present magnificent system of industrial arts and vocational education of which all America is so proud.

In 1876 the men who had started these early industrial school efforts formed the Industrial School Association, and we, their successors can, if we choose, attend the convention of a similar organization, the American Vocational Association, in the same, though much older, city of Boston.

Then, too, Boston is a town full of intriguing historical remnants of the early existence of our country. With but a little imagination we can picture the stern resistance of the citizens of Boston which brought on the "Boston Massacre," and the "Boston Tea Party," with its dire aftereffects. Stretching our imagination a little more we can hear the clip-clop of Paul Revere's horse as he rides through the night.

Truly, a trip to Boston to attend the American Vocational Association convention is a must for those interested in industrial arts and vocational education. Let's go.

THE 1952 IAVE INDEX

Readers of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION will kindly take notice that if they want an index for Volume 41, they are asked to send in their request to our circulation department as soon as possible.

There are many of our subscribers who do not bind the monthly issues into a single volume. Printing the index for every subscriber, therefore, is an unnecessary and expensive task. While we realize that this request throws an extra burden on our readers, we trust that they will kindly overlook this fact, and send us a post card if they want an index. And, do not wait too long, our supply may become exhausted.

Casting a backward glance over the material that appeared in the 10 separate issues of Volume 41, discloses the fact that a total of 235 articles were published.

The men who wrote these articles came from every walk of the educational fraternity. There were those who had just left the teacher training institution, there were men with years of experience, there were teachers from grade school, junior high, senior high, technical high, part-time and full-time vocational schools, adult-education programs, and teacher colleges.

It also is interesting to note that these articles were written by men who are serving education in all parts of our country. The fact that some projects, for instance, were submitted by teachers in the elementary schools, some who teach junior high schools, and some who have high school or teacher training students, assures us that they will cover students of all levels in the schools mentioned.

There can necessarily be but a limited number offered; nevertheless, they add up to a goodly number during the year, and they are offered, not with the idea that they all are the best that could be found, but rather that they are a basis for making better projects. A good teacher of industrial arts and vocational education needs but an idea to produce a good project, and please remember, when you think up a good one, let's pass it along. Probably someone can change it to something that is even better.

In the meantime — many thanks for providing the valuable material for us to pass on to the thousands of fine teachers who make up our lists of readers.

WHAT HAPPENS TO MOST BOYS

The Wisconsin Manufacturers Association in co-operation with the apprentice division of the Industrial Commission of Wisconsin has issued a paper entitled "What Happens to Most Boys," which contains a lot of good information for all youngsters.

According to this leaflet, most boys drop out of school at some level or another, be it grade school, high school, or college. Then they get a job — they want high wages and don't seem to care about the future. Then they marry.

After that they are stuck — they must take jobs where competition with workers who can be prepared in a short time to acquire simple skills is very high.

Smarter boys who have remained in school, probably been graduated from high school or have gone to college for a year or two, also have to leave school sooner or later. They attend school until they have been graduated at some level higher than the eighth grade. When they apply for a job, they want one that promises real training rather than high wages at the start. They may enter an apprenticeship and in that way prepare themselves to acquire special skills and get the greater happiness out of life enjoyed by those who have learned to analyze mechanical problems, read blueprints, and interpret technical and engineering descriptions.

A man who has served an apprenticeship in any of the important trades has something that will be of assistance to him throughout his life, even if he enters another occupation from the one in which he served as an apprentice.

The shop teacher in the school can perform no greater service than to sell the apprenticeship idea to his industrial-arts students.

Do Your Students Know How to Study?

BENJAMIN J. NOVAK
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Philadelphia
and Lecturer in Vocational Education
Temple University

How often do we admonish our students to "study hard" without reflecting that the expenditure of long study hours in itself guarantees little. One hour of efficient, well-planned study is superior to two or more hours of undirected lackadaisical dawdling. There are techniques contributing to more effective study, just as there are specific ways of performing shop operations. The problem of how to study must not, however, be thought of as a concern only of the classroom teacher. Each instructor, in every conceivable subject field, needs to concern himself with the matter.

Before attempting to consider ways of helping students to study more efficiently, we can do well to ask ourselves a few considered questions. Do we try to make assignments real, or are they abstract, uninteresting, and apparently pointless? In what ways will your students be *better off* for having studied the work which you have given them? Is assigned material clear and understandable? Does the student know what is expected, or is there an exhortation to *study* or *tell all about* some broad or vague topic? Is the sum total of assigned work excessive or insufficient for the study time of the students? The skill needed to make effective study assignments is just as important as that required in mastering material to be studied.

Here are some related problems: How much home study is it reasonable to expect your students to accomplish? Should most study be at school under supervision? Can the student read the material assigned? Is the learner suffering from health or physical handicaps? Does he have a schedule and place for study? Does he obtain sufficient rest and time?

In the decade between 1925 and 1935, interest in *how to study* was at high tide, as may be attested by the dozens of books and monographs which appeared on the subject, both in this country and abroad. Some intriguing titles are: "The Art of Study," "The Science of Study," "How to Study for Examinations," "How to Pass Examinations," "The Art of Work," and many others. Several currently useful references are appended to this paper.

There are some general procedures which can assist the student to develop more efficient study habits. In addition to the general suggestions made here, the references provide information on special matters such as: book reports, graphs, maps, tables, mathematics problems, English literature, English composition, and studying shop subjects.

The study outline which follows may be used for reference by the interested student, serve as a basis for group discussion, or be employed in some other way in which there can be motivation, spontaneity, and extensive participation by the students. The outline may be kept in the background as a guide for the teacher. If it is *taught* as a series of formal lessons, they are likely to do more harm than good.

Hints to Make Studying Easier

I. *Why Study?*

1. Study is exercise which develops your ability to tackle life's problems, just as practice in the gymnasium builds muscles and athletic skill.

School study helps you meet life's challenges and develop your interests. Study is easy when you are interested in some-

Students at Dobbins Vocational-Technical School, Philadelphia

thing. You can't always be interested in your school subjects but if you work on and master something, your interest will start to grow. Give yourself and each school subject a fair trial!

2. Without study and education, your chances of holding down a good job and getting along in this complicated world are reduced. People out of school can tell you that you need to know more than just how to use your hands in running a lathe, typing, or giving a manicure. A good, *all-round* education *pays off*, in *salary* and happy living.

3. Studies may seem tough at times, but the chances are that you have the ability to make the grade, otherwise you wouldn't have gotten this far in school. Don't be a quitter!

Very few people use all their brain power and even the brightest people must study. If after getting help from your teachers and sticking to a good study schedule you still have trouble, make an appointment for a conference with your counselor.

II. *Planning Your Study*

1. Should you spend all your spare time studying? Of course not, but plan to set aside a definite time and place for it, then stick to your schedule. Study is a habit, and becomes easier when it follows a regular schedule.

If long hours at work, play, sports, or *dating* interfere, then you are heading for trouble. What is your usual time for going to bed on school nights? Remember that no human being can be successful or healthy if he tries to do too much, and does not get enough rest. Choose conscientiously, and put first things first!

2. Some study each day is better than an all night *cramming* session right before the test.

3. Concentrate on your study. Don't dawdle and poke halfheartedly over the assignment. Don't put off the tough part until you are tired, but do it first.

4. Have a definite work place away from distraction and interruption. Have everything you need ready before you begin.

Should you have the radio on and study? Maybe — it depends on you and the kind of program. Psychologists have proved that you cannot *pay attention* to two things at once. Habits let us do one thing *without* paying attention, while we are thinking about something else. Thus, actually *listening* to the radio and studying can be done only by shifting your attention back and forth. This is a great strain, and is practically impossible. Quiet radio music often does not distract the attention from study.

Why are there warning signs against talking with the motorman of a trolley car when it is moving?

What do you think of studying while watching a television program?

5. How much time should you average each day for study?

It is not only how long you study, but how intensely and energetically you work that counts. Lounging in a soft chair is a hindrance. Study with pep and push. An hour of real study is better than two hours of halfhearted work. Remember also that some people need more study time than others. Figure out your own needs.

6. Do not have the room too hot, and try to get good ventilation.

7. Don't study only when your teachers give you an assignment. Have regular scheduled study time in which to review your school subjects, and do some new reading of your own. Use the library. Write brief summaries of what you have learned.

8. If you are having trouble, check with your teacher for extra help. "A stitch in time saves nine."

9. You can't study very well if your books are resting at school in your locker.

III. *Tackling the Assignment*

1. Start in at once. Don't dawdle.

2. Read over the entire assignment first. Be sure you've understood it. Plan how to tackle the lesson.

3. If you have a textbook chapter to study, note the main topic headings, and sentences in italics and heavy type.

4. Be sure you read carefully the graphs, tables, maps, and diagrams. When you come across words you don't understand, look up their meanings and write them down. Each subject has its own vocabulary.

5. Study means more than just reading. At the end of each paragraph put aside the book and express the meaning of the paragraph briefly *in your own words*. See if you can write the idea of each paragraph in one sentence.

Remember that when you want to *understand* an idea it is not wise to memorize it. If you can put it into your own words you are almost sure to understand it.

6. After reading the whole lesson over once, recite to yourself (in your own words) the main points. Check back over the points you miss.

Re-read the lesson, paying particular attention to the parts that gave you trouble. As you learn each important fact, try to give an example for it from your own experience or associate it with something that you already know. This will help you to remember.

7. Learn to read and study as rapidly as you can and still understand your work. You can increase your reading and study speed by trying this way.

8. Review work you already know every chance you get. Just as athletes need warm up and practice, so do you. What about those spare moments while the roll is being checked or you are waiting for a lesson to be assigned?

9. Can you study better alone, or with someone else?

That depends on what you are doing, and what kind of *team* you make with the other person. Sometimes reciting to someone else material that you have studied or memorized is helpful.

Studying a great deal with someone else tends to distract or make you become too dependent. One trouble is that one of the team tends to do most of the work. Learn to stand on your own feet!

What is the objection to having a classmate do half of an assignment while you do the other half, then copying?

IV. *Keeping Notes*

Good note taking is a very important help to learning, therefore it should be done carefully.

A good notebook nearly always means good learning, that is why the teacher checks it so carefully. Remember, though, that the chief purpose is not the beauty of the notebook itself, but how well it helps you to learn and understand. The making of the notes is important learning exercise, therefore avoid copying someone's else ready-made notes. Make sure that your notebook is the best effort of which you *yourself* are capable.

1. It usually is best to have a fairly large loose-leaf notebook.

2. Keep notes in ink or type them. Penciled notes soon smudge.

3. Use outline form rather than solid paragraphs of word-for-word copying. Don't run everything together, but leave a space or start a new page for each topic. Be sure that each topic has a title.

4. As soon as possible (the same evening

if you can), rewrite your notes, using your own words and adding other important points that you have read. Rewriting your notes each day helps you to learn your work, and you will have to do very little study later for tests. What is the objection to recopying all your notes the night before they are due to be handed in?

5. Underline important facts in your notes with a red pencil so that you won't miss them.

6. Have a table of contents in the front of your notebook. Make a vocabulary list in the back, of words that you have trouble spelling or understanding. The ability to spell is *learned,* and it is never too late to improve. You must, however, work at it.

7. Include appropriate clippings, pictures, and drawings in your notes.

8. Keep all notes for each subject together in proper order. Don't keep them on several odd sizes of paper.

9. When you are absent, you may be able to copy notes from a classmate who has a good set. Make a note that they were copied from this student. Check the notes over with your teacher.

10. At the end of the semester don't be in a hurry to throw away your notes. You may need them later.

V. *How to Memorize*

Most of our learning involves the *understanding* of ideas, rather than word-for-word memorizing. When we want to understand something, it is best to put the idea into our own words.

Sometimes, though, it is necessary to memorize word-for-word. If so, here are a few suggestions:

1. Be sure you understand the material thoroughly. Read it carefully and learn what each word and sentence means. What ideas are expressed?

2. Read the material through several times, not too rapidly, paying close attention, and thinking of the meaning. Thoughtless repeating of words without attention to ideas does little good. Try to make mental pictures of what you are reading.

3. Study the whole situation as a unit. Do *not* study a poem, for example, stanza by stanza. Psychologists have found that you memorize faster by studying the whole thing. In this way you also don't have as much trouble remembering which part follows the other.

Try to repeat the whole thing with the book closed. Give some extra time to a careful study of difficult parts, but then go back and study the whole thing again.

4. Don't give up because you cannot at first remember what you are trying to memorize. Your nervous system is learning subconsciously.

5. Short study periods over several days are better than one long session.

6. Do not use mnemonic devices to help you memorize. (A mnemonic device is a set of letters or other artificial scheme which is supposed to help you to memorize.) These are confusing because they have nothing to do with the material itself. It is better to learn the material the way in which it is going to be used.

7. Once you have memorized something, review it from time to time if you don't want to forget it.

VI. *What to Do About Absence*

Work that is missed because of absence is hard to make up. Don't stay away from school unless absolutely necessary.

No absence, regardless of how good the reason, can ever excuse you from getting your schoolwork done.

1. Find out what you missed. (If a fellow student says you didn't miss anything, he probably is mistaken.) Don't wait for your teachers to remind you. They have many students, and can't take too much time with you in class. Each teacher, though, has a conference time and will be glad to give you help.

2. Fellow students can often help you to catch up in written homework. It is always a good idea, though, to check it over with your teacher in order to be sure that you understand it.

3. If you are going to be out of school for a long time, and are able to do some home study, your teachers will be glad to arrange for studies to be sent to you to keep you up to date.

4. When you return to school after an absence, don't try to copy back written material in class. It is better to try to understand the lesson then being taught, and catch up later. Remember that you cannot copy notes, and pay attention to a lesson at the same time.

5. You cannot be absent, then follow strict *union* working hours when you return. Spend a little extra time until you get caught up.

Selected How to Study References

(Teacher and Student Use)

1. Crawford, Claude C., *Studying the Major Subjects.* Published by author at University of Southern California, 1930, 384 pp. (contains aids for specific subject fields, including literature, composition, mathematics, physical science, biology, social studies, shop work, physical education and health, and fine arts).

2. Kornhauser, Arthur W., *How to Study,* University of Chicago Press, 1937, 55 pp.

3. *Streamline Your Reading,* Science Research Associates, Chicago. Life Adjustment Booklet, 1949, 52 pp., 40 cents.

4. *Study Your Way Through School,* Science Research Associates, Chicago, Life Adjustment Booklet, 1949, 48 pp., 40 cents.

5. Frederick, R., and Burton, W. D., *How to Study Handbook,* Appleton Century, 1948, 442 pp., $1.25.

6. "Are Your Habits Showing?" *N.E.A. Journal,* Nov., 1950, pp. 56–57 (two pages of cartoons).

Are You a Good Housekeeper?

A shop that's well equipped with tools,
Must need be governed by some rules;
With saws and hammers, bits and braces,
And planes and chisels in their places;
Whatever work, if well begun,
With tools all handy, is half done —
So when a job you do complete
Clean up your bench and leave things neat,
Take time to put your tools away —
You'll make it up some other day.
The fool will throw his tools around,
And fret and fuss until they're found.
The wise will put this in their bonnet —
It's good advice — act upon it.

— Wm. S. Sawle, Sr., *Arena, Wisconsin*

Submitted by D. L. Lampman, Ottumwa, Iowa

PROBLEMS AND PROJECTS

MODERN WOOD TABLE LAMP

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The table lamp in Figure 1 is the result of a search for a woodworking project which would present a problem to the student and yet offer a number of solutions to that problem. While student interest was one of the foremost considerations, sufficient weight was given to the informational and operational aspects of woodworking. This project has proved its worth in projecting the fundamentals of tools and materials.

Method of Procedure

1. Lay out side view upon a 4 by 6 by 10-in. piece of stock, as per Figure 2.

2. Locate and bore holes for fixture. Due to the shape of the base, the hole must turn at or near the center of the stock. This requires the use of two holes which must meet within the stock. From the bottom of the stock, as positioned by the layout, bore a ½-in. hole approximately 5½ in. deep. From the top of the stock, bore a 5/16-in. hole to meet the first hole.

3. Cut to approximate shape with band saw or coping saw.

4. Round all corners and cut to shape with wood file.

5. Carve hollows in stock to suit design. This may easily be done with a firmer gouge.

6. Sandpaper to smoothness; finish with No. 6/0 sandpaper.

Any number of finishes may be used to enhance the beauty of the finished lamp base, but light or dark modern finishes are best suited. The following finish was used with good results.

Schedule for Finishing Lamp Base

1. Stain with Lichen green (dark) water stain. Allow to dry overnight.

2. Seal with one to one mixture of varnish and turpentine, allow to dry eight hours, sand smooth.

3. Apply white filler, allow to dry 24 hours and then seal as above.

4. Finish with three coats of clear varnish, allowing 36 hours between coats.

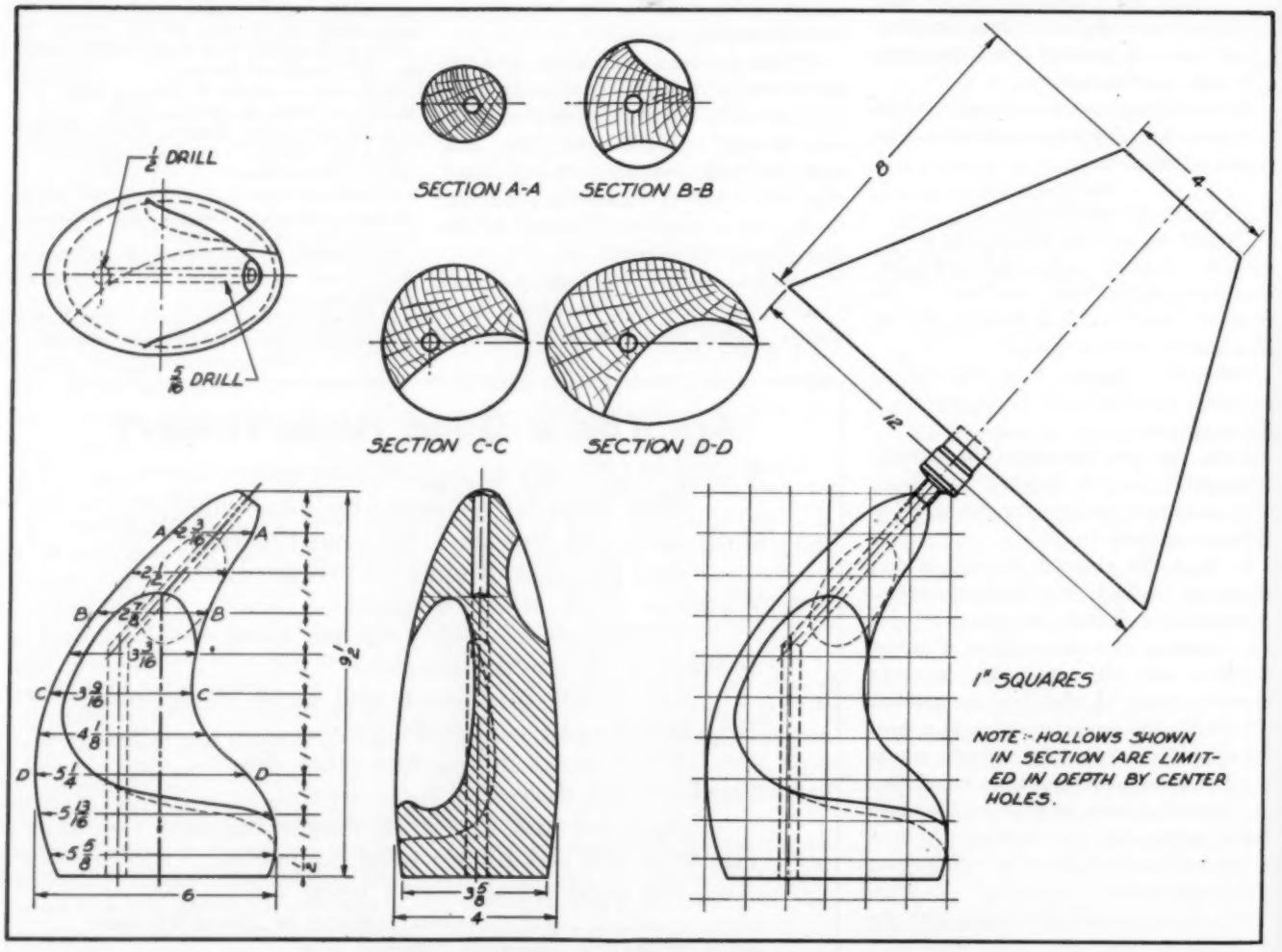

Fig. 2. Details of modern table lamp of wood

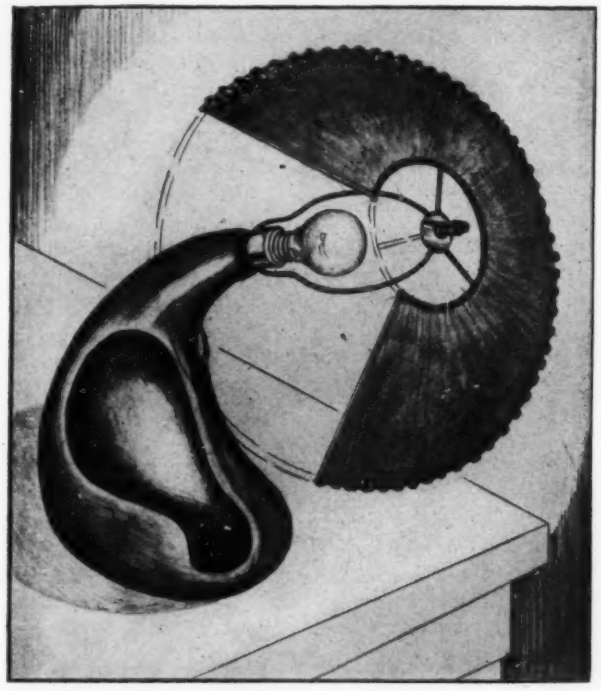

Fig. 1. Modern wood table lamp

5. Hand rub finish with pumice stone and water.

In constructing the shade, use fiber glass shade material laced to the wire frame with plastic lacing. Two wire rings with diameters of 4 and 12 in., are to be used for top and bottom respectively. Use a shade holding harp for supporting the shade.

PLASTIC MONOGRAM FLEXIBLE BOOK ENDS

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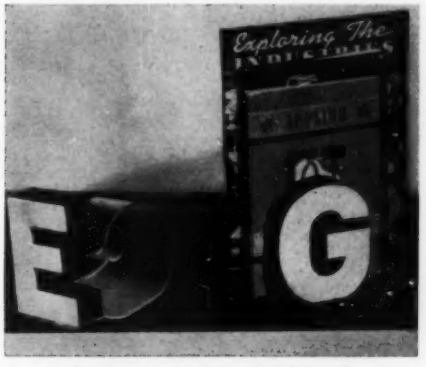
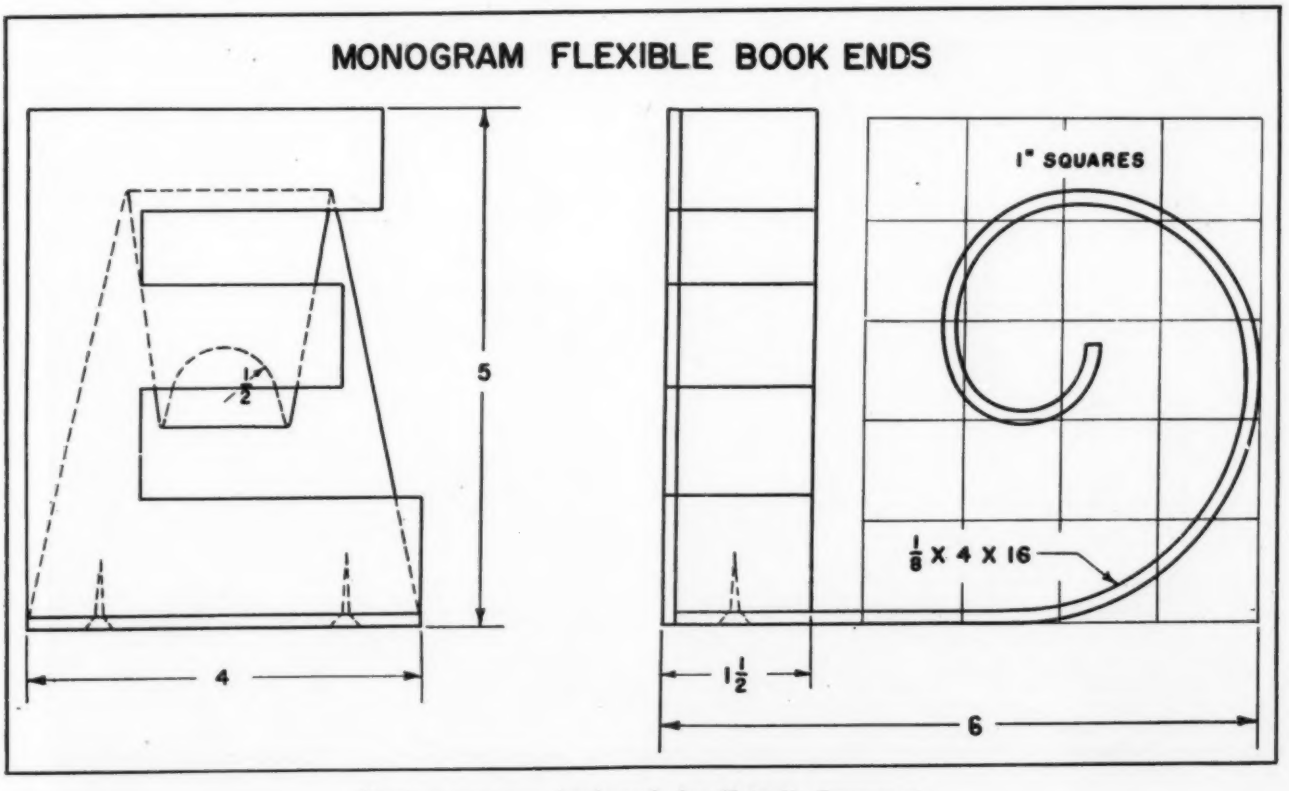
Book ends which match or contrast with the design of the desk set are desirable accessories. They are not too difficult to make, and the result will captivate the interest of even the most exacting craftsman. This particular type of project offers more possibilities for individuality than almost any desk novelty.

The flexible book ends pictured use a combination of Plexiglas or Lucite and wood. Here again they may be personalized by using



Plastic monogram book ends



Plastic monogram book ends by Chris H. Groneman

one's initials. The white fronts in the picture are frosted surfaces obtained by sanding, or they may be made from ivory translucent material.

The plastic and wood letters were cut after the plastic had been glued to the wood.

The flexible book holder was made from thin ⅛-in. sheet stock which was coiled as indicated in the drawing. It may be fastened to the bottom of the wooden letters with screws.

Book ends of this type are not quite as flexible as the steel ones, but they are very unusual and quite as satisfactory for their purpose.

BILL OF MATERIAL

No. of Pcs.	*Name*	*Material*	*Size*
2	Fronts	Plastic	⅛ x 4 x 5
2	Backs	Wood	1⅜ x 4 x 5
2	Coils	Plastic	⅛ x 4 x 16
4	F.h.b.	Screws, wood	No. 6, ¾
		Plastic cement	

Procedure

1. Lay out Plexiglas or Lucite piece for monogram.
2. Cut out the plastic monogram to rough size.
3. Lay out the wood back for monogram.
4. Cut out the wood back to rough size.
5. Cement the plastic monogram to the wood back.
6. Cut out the monogram with a coping or jig saw.
7. Plane and file the edges.
8. Sand the edges.
9. Make a template for the flexible plastic holder.
10. Transfer the template to the plastic.
11. Cut out the flexible plastic holder with a coping, jig, or band saw.
12. Plane and file the edges.
13. Polish the edges on a cloth buffer.
14. Center punch and drill the holes in the plastic holder for mounting the monogram.
15. Heat and form the holder according to the template shown on the drawing.
16. Sand the surface of the plastic monogram to produce a white, frosted effect, if translucent material is not desired.
17. Apply a finish to the wooden portion.
18. Attach the holder to the monogram with f.h.b. wood screws.
19. Apply a high grade of wax and polish with a soft cloth.

CATCH PUZZLE

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Nearly everybody is intrigued by a clever puzzle. One project of this type may well be included in almost any woodworking area. This particular puzzle involves 13 instructional units in hand woodworking, and has been used successfully with various progress levels.

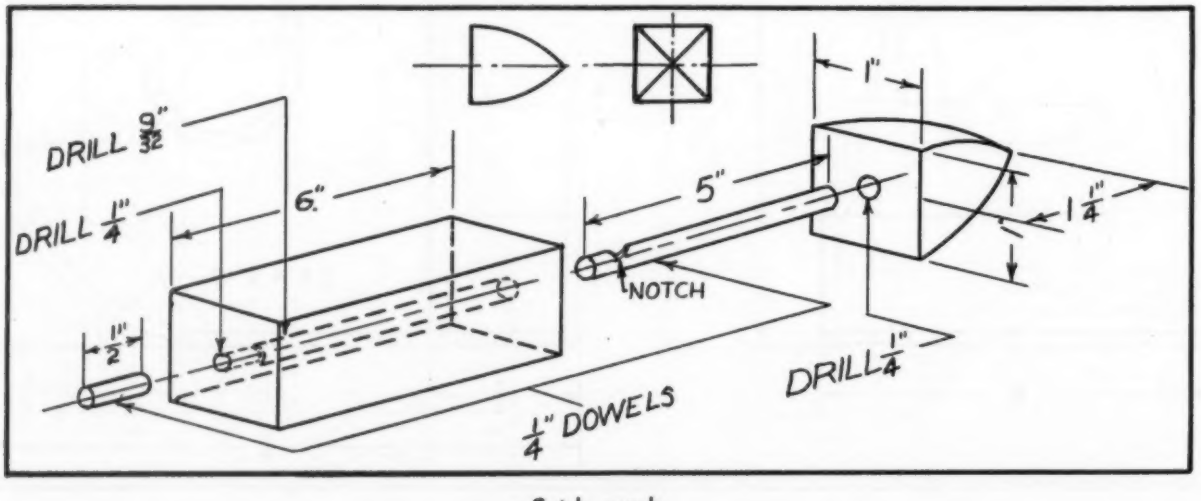
The object of this puzzle is to have the *victim* try to catch the rubber band with the notched plunger. If caught, the knob would naturally snap back with a distinct sharp report. A little of the magician's lingo, while demonstrating and supposedly trying to allign the notch in just the right position, adds to the mystery. Actually, the rubber band is never caught; the operator merely extends the knob and plunger a suitable distance, about one half inch, so that when pressure is applied by the thumb and index finger, the pointed knob appears to snap back in position. As with most manipulative operations, a little practice makes for smoother performance.

Material: The body can be made from scrap stock, and the dowel rod is readily available.

Trying to catch the rubber band

PROCEDURE, TOOLS, AND SUPPLIES

Procedure	*Tools*	*Supplies*
1. Select stock for appropriateness.	Rule	
2. Plane a surface true.	Smooth plane	
3. Plane an edge square with surface.	Smooth plane	
4. Lay out and saw with backsaw.	Backsaw	
5. Score a line with marking gauge.	Marking gauge	
6. Duplicate units 2, 5, 2, 4.	Same as 2, 5, 2, 4	
7. Lay out and drill with twist drill.	Hand drill, ¼, 9/32 drills	
8. Glue stock edge to edge.	Dauber	Glue, rubber bands
9. Lay out and cut with coping saw.	Coping saw	
10. Whittle with knife.	Pocketknife	
11. Smooth with abrasive.	Sanding block	No. 80–150 abrasive
12. Shellac stock.	Small brush	4-lb. cut shellac
13. Wax stock.	Soft pad	Paste wax



Catch puzzle

Ah! Now it's caught

UPHOLSTERED FOOTSTOOL

WM. G. FORD

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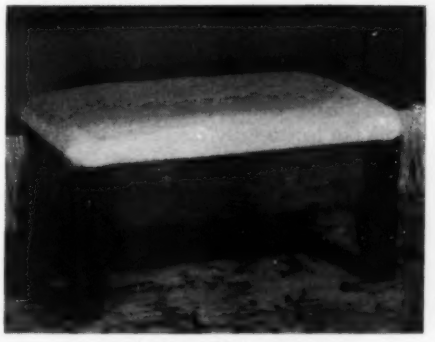
The problem of finding a suitable project that involves a number of operations is often difficult. The upholstered footstool described here was designed to give beginning students in hand woodworking a number of learning units in addition to simple upholstering. This project makes good use of small stock that accumulates in the stock racks and may be constructed at a small cost. This footstool is not only modernistic, but is rugged in construction and may be made to match furniture in the home.

Students are allowed to make changes in size or design of parts as long as they accomplish the operations in the plan and are approved by the instructor before starting work on the parts. Students make a dimensioned, three-view sketch of each part of the footstool and a bill of material before checking out stock.

If walnut, cherry, or similar woods are used, a coat of oil, made by mixing three parts of boiled linseed oil and one part of turpentine and applied hot, brings out all the tones of the grain patterns. After the oil has been applied, it is allowed to stand until the desired tone is reached and then wiped thoroughly clean of all excess oil and allowed to dry overnight. A clear finish of shellac and varnish, or other suitable finish, gives it a very professional appearance.

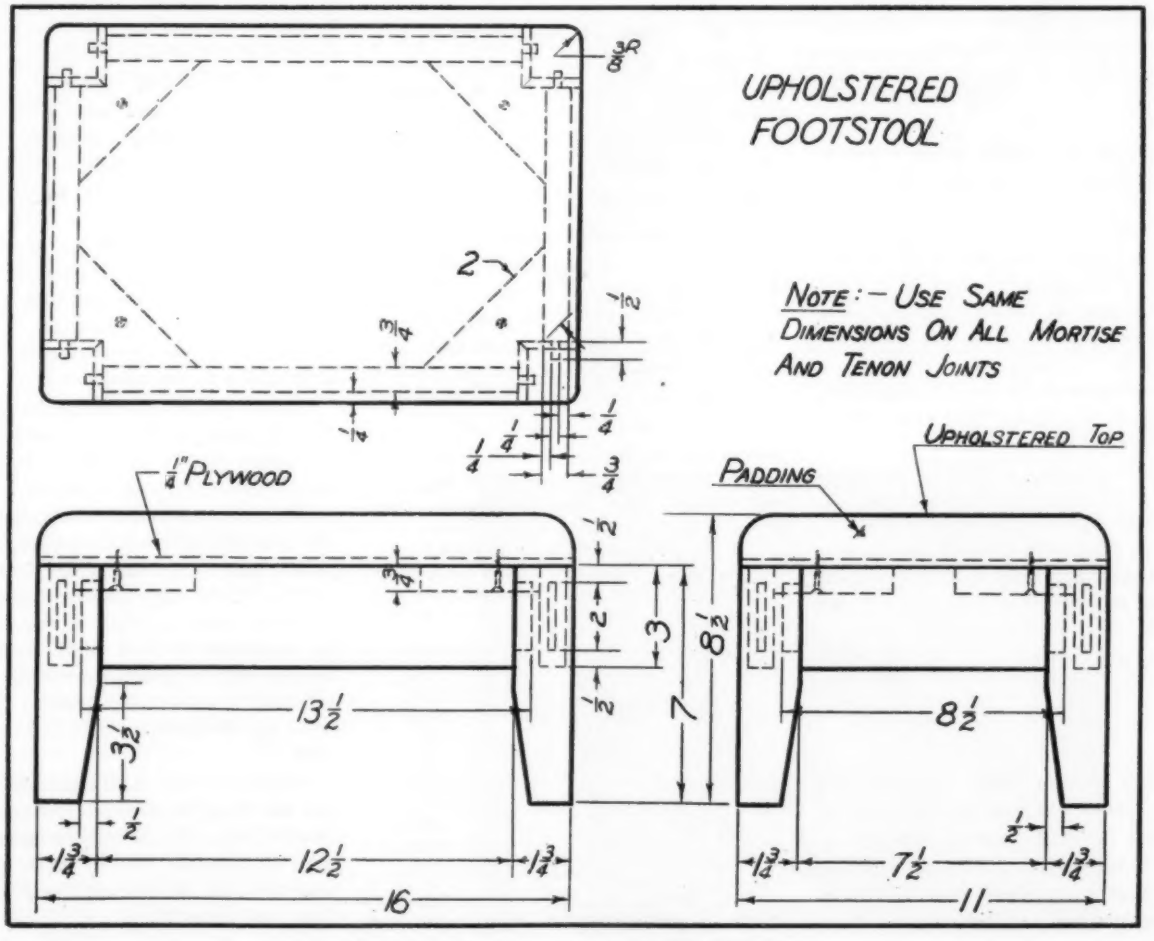
Padding materials may be obtained from old car cushions if other padding material is not available. Students may bring upholstering cloth from home to match furniture they already have. Plastic covering material is very effective.



Upholstered footstool

BILL OF MATERIAL

No. of Pcs.	*Name of Part*	*Size*
2	Side rails	¾ x 3 x 13½
2	End rails	¾ x 3 x 8½
4	Legs	1¾ x 1¾ x 7
4	Corner blocks	¾ x 2 x 5
1	Seat bottom	¼ x 11 x 16 (plywood)
4	Screws	No. 6 x 1½ f.h.b.
	Covering material	
	Padding	
	Tacks — ¼ in.	



Detailed drawing of upholstered footstool

Test on Upholstered Footstool

MULTIPLE CHOICE EXERCISE — ONE CORRECT ANSWER

Directions: Each of the following statements can be correctly completed by one and only one of the numbered expressions. You are to write the number which stands for the correct expression on the line at the left of the exercise. Use blueprint with test.

.. 1. The height of the stool is (1) 7 in.; (2) 11 in.; (3) 8½ in.; (4) 3 in.

.. 2. The length of the stool is (1) 12½ in.; (2) 16 in.; (3) 11 in.; (4) 8½ in.

.. 3. The width of plywood used for the seat bottom is (1) ¼ in.; (2) 2 in.; (3) 8½ in.; (4) 11 in.

.. 4. The thickness of the end rails is (1) ¾ in.; (2) 2 in.; (3) ¼ in.; (4) 3 in.

.. 5. The corner blocks are made from stock that has a width of (1) 2 in.; (2) 5 in.; (3) ¾ in.; (4) ½ in.

.. 6. The length of the side rails is (1) 8½ in.; (2) 11 in.; (3) 13½ in.; (4) 16 in.

.. 7. The distance between legs on the end is (1) 8½ in.; (2) 7½ in.; (3) 11 in.; (4) 8 in.

.. 8. The thickness of the plywood used for the seat bottom is (1) 1 in.; (2) ¾ in.; (3) ½ in.; (4) ¼ in.

.. 9. The length of the taper on the legs is (1) 3½ in.; (2) 3 in.; (3) 2 in.; (4) 7 in.

.. 10. The seat is attached to the frame at the corner blocks by means of (1) flat head screws, (2) tacks, (3) 6*d*. nails, (4) glue.

.. 11. The length of the legs is (1) 8½ in.; (2) 7 in.; (3) 3 in.; (4) 2 in.

.. 12. The taper on the legs goes from 0 to (1) ½ in.; (2) ¼ in.; (3) 1 in.; (4) 1¼ in.

.. 13. The radius of the rounded edge of the legs is (1) ¼ in.; (2) ½ in.; (3) ¾ in.; (4) ⅜ in.

.. 14. The width and thickness of the top of the legs is (1) 2 in.; (2) 3 in.; (3) 3½ in.; (4) 1¾ in.

.. 15. The distance between the outside edge of the leg and the outside face of the the side rail is (1) ¾ in.; (2) ½ in.; (3) 1 in.; (4) ¾ in.

Answers to test on upholstered footstool:

1. 3	4. 1	7. 2	10. 1	13. 4
2. 2	5. 1	8. 4	11. 2	14. 4
3. 4	6. 3	9. 1	12. 1	15. 1

Although no more than 1 per cent of a barrel of crude oil goes into petrochemicals, this 1 per cent finds its way into literally thousands of products, including paints, plastics, alcohols, and practically all of the synthetic rubber used. — *Petroleum Newsnotes*

TEACHER-MADE 2 BY 2 SLIDES

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Experience has shown that visual education of all types when employed during a learning situation helps the learner retain more material, helps increase basic understanding of principles taught, and makes the learning situation more attractive to the prospective learner. Most of us know how sound movies do much to impart information to learners, and to help make desirable changes of attitude in them. Probably fewer of us realize that teacher-made 2 by 2 slides can play an important part of all areas of training, especially in industrial-arts education because they can be made to pertain to specific things, and they can be arranged in any sequence desired. It is possible for any teacher to produce excellent 2 by 2 slides for classroom use at little cost in either equipment or material with just a little practice.

Materials Needed

A roll of 35mm. film (microfilm, direct positive, or color film); material to be copied; 8 oz. of Kodak D11 developer; 8 oz. of Kodak stop bath; 8 oz. of acid fixer; 8 oz. of Kodak Photo Flo; Kodak 2 by 2 Ready-Mounts; water, paper clips, and weights.

Equipment Needed

Any 35mm. camera; a 2+ Kodak Portra lens; lens shade; a cable release; copy stand; a 9 by 11 single weight plate glass; and 8-oz. 35mm. daylight loading developing tank; photographic thermometer; a pair of scissors; simple drafting equipment; two No. RFL-2 photofloods; and a photometer (optional).

TABLE 1. Subject Distance and Approximate Field Size for 2+ Portra Lens

Camera Focus (Scale setting in feet)	*Distance From Subject to Portra Lens in Inches*	*Field Size in Inches 28 x 40mm. Negative Average Focal Length of Lens — 50mm.*
Inf.	19½	10⅞ x 15½
50	19⅛	10½ x 15⅛
25	18½	10¼ x 14⅝
"Fixed"	18	10 x 14¼
15	17¾	9⅞ x 14
10	16⅞	9¼ x 13¼
8	16⅜	8⅞ x 12¾
6	15½	8⅜ x 12
5	14⅞	8 x 11½
4	14	7½ x 10¾
3½	13⅜	7⅛ x 10⅛

NOTE: The use of a 1+ or a 3+ supplementary Portra lens will permit the use of smaller copy or larger copy.

Procedure

Step 1. *Drawing the Copy*

1. Use white nonglossy drawing paper and black India ink.

2. Lettering should be as large as possible and the use of a printing aid is advisable (LeRoy, Wrico, and the like).

3. Lines should be as heavy as possible. See Figure 4.

4. Figures to be drawn should be as large as possible as space will permit. *Simplicity is the rule.*

5. Simple cartoon drawings are the best.

6. When trying to get across a complex idea it is best to make four or five slides showing the steps of procedure involved instead of trying to get across the idea with one slide.

7. Size of the copy depends upon the distance from the Portra lens to the copy surface. See Table 1. Copy size will vary from 6⅛ by 9¼ in., to 9⅜ by 14 in., when the 2+ Portra lens is used on the front of the camera lens.

8. Use a larger size paper for copy when using Table 1, to determine copy size. Use no border lines as it is practically impossible to center your camera on the copy stand when border lines are on the copy.

Step 2. *Photographing the Copy*

1. Load the camera with microfilm line work such as drawings. Microfilm will give a very high contrast negative which is desirable when copying line work. If you are copying lamps, tools, footstools, or other material where tone is desired, indoor or outdoor color film or direct positive film must be used.[1]

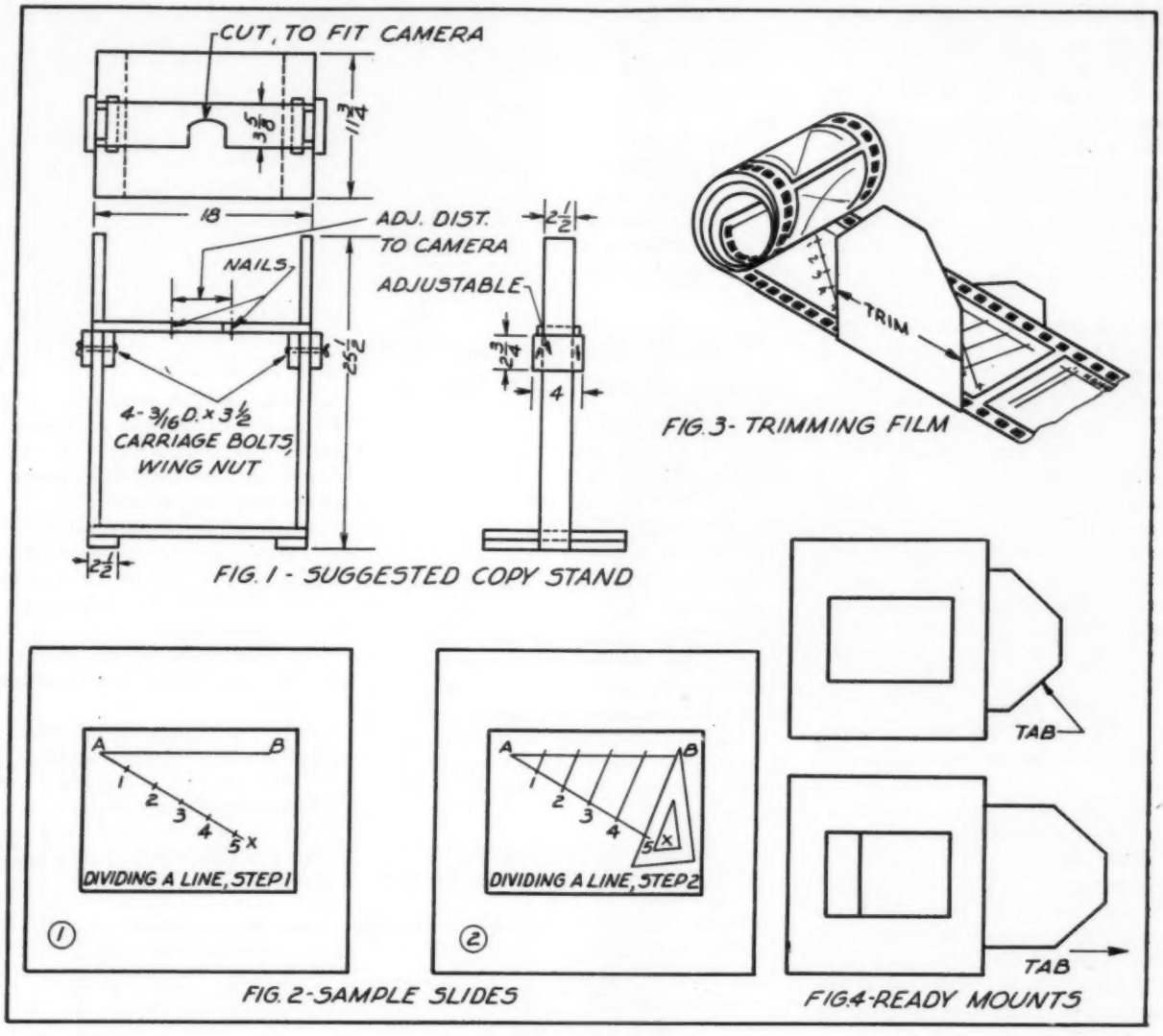
2. Attach 2+ Portra lens and lens shade to the front of the camera. Be sure Portra lens is *facing the correct way*. Attach the cable release to the camera.

3. Place camera in the camera mount of the copy stand, as shown in Figure 5.

4. Place copy in position on copy surface with a piece of plate glass over it. Position of copy can be determined beforehand by placing camera in the camera mount with the camera back off and the shutter opened. Then place a piece of semitransparent material such as tracing paper or cloth or acetate against the opening in the back of the camera where the film usually passes. By moving the copy back and forth the exact position can be located and the camera will be centered on the copy.

5. Place two No. RFL-2 photofloods about two feet from the center of the copy and at about 45 deg., with the copy surface. An acute angle is desirable here to avoid light from reflecting from the plate glass into the camera lens. See Figure 5.

[1]Production temporarily suspended.



Teacher-made slides

6. Adjust the distance from the Portra lens to the copy surface by sliding the camera mount up or down and tightening the wing nuts, as shown in Figure 1. To determine proper distance from Portra lens and copy surface see Table 1.

7. Adjust the focus on the camera.

8. Determine the correct exposure, e.g., *f* stop, shutter speed. This can be done by placing a light meter on top of the copy itself and then turning on the photofloods (Incident light meter). With two No. RFL-2 photofloods at 45 deg., with the copy surface and two feet from the center of the copy, with microfilm in the camera the exposure will be about ⅛ sec. at *f* 20. Most camera stores sell guides which will help determine exposure when a light meter is not available. Table 1 can be used to determine exposure also.

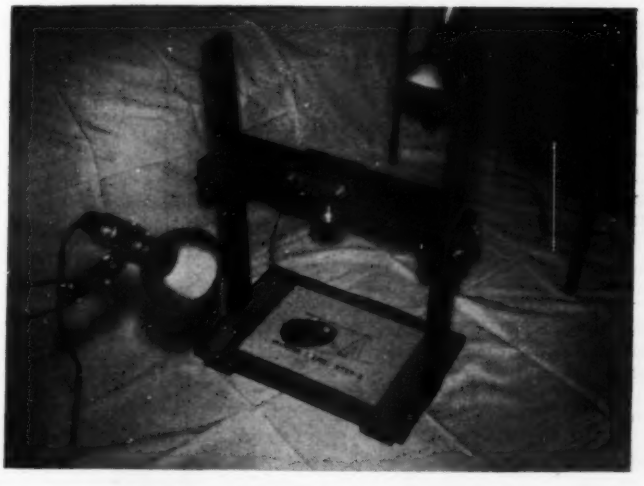


Fig. 5. Camera in the copy stand

9. Expose the film by pressing the shutter. Turn the film and repeat directions 4 to 9.

Step 3. *Developing the Film*

1. Load the exposed roll of film in the developing tank in a darkroom or closet.

2. Bring developing tank out of darkroom and pour 8 oz. of Kodak D11 developer into tank. Develop for about five minutes at 68 deg. F., agitating every few minutes. Follow these directions for microfilm only; for other film follow the suggestions supplied with the film.

3. Empty tank and pour 8 oz. of stop bath into it. After agitating the tank for a minute empty the stop bath out of it.

4. Pour 8 oz. of acid fixer solution at 68 deg. F. into the tank. Fix film for about 5 to 10 minutes, agitating every few minutes, especially at the beginning.

5. Take the film out of the tank, being careful not to touch the emulsion on the film. Then rinse the film in running water for about 20 to 30 minutes.

6. Run the film through a pan of Kodak Photo Flo solution to insure even drying and the disappearance of water marks on the emulsion.

7. Dry the film slowly overnight by suspending it from paper clips, using a weight at the bottom of the film to insure against curling.

Step 4. *Mounting and Projecting the Slides*

1. Cut film into individual frames, *keeping fingers off the emulsion.*

2. Fold one of the cutting guides supplied with the ready-mounts and center the frame in the guide. Trim off the ends of the frame extending beyond the guide. See Figure 3.

3. Pull the tab in the open end of the ready-mount slightly. Insert the frame in the ready-mount. Pull tab completely out and center the film in the ready-mount. See Figure 4.

TABLE 2. Photoflood exposure table.

Tungsten Film Speed Rating		*5 to 8*	*10 to 16*
G.E. Photoflood Lamp	*Shutter*		
Four No. 1 or two No. 2, or one No. 4 in good reflectors, or two No. RFL-2	1	90	128
	1/8	40	57
	1/25	18	26
	1/50	13	18
	1/100	9	13

NOTE: Microfilm has a rating of about 5. Indoor Kodachrome rates 16 tungsten, and Direct Positive rates 50 tungsten.

For example: Using two No. RFL-2 at 1/8 sec. Microfilm indoor rating is 5. The guide number is 40. Lamp to subject distance is 2 feet, $\frac{40}{2} = 20$, thus use *f* 20 for lens.

4. The open end of the ready-mount should be sealed with the point of an electric hot iron.

5. Hold the slide so that the picture is viewed as it should appear on the screen. See Figure 2.

6. Mark the *lower left hand corner* with a dot or number which will identify the slide in a series of slides, as shown in Figure 2.

7. When inserting the slide in the projector the dot or number should be at the *top right hand corner* and should face the back of the projector.

CANAPE PLATE, HANDY SERVER, AND SNACK SUSAN

CARL S. GASSEN,
and
STANLEY A. GLOW
Industrial Arts Department
Township High School
Evanston, Ill.

This series of projects incorporates beauty and practicality with educational value. The making of these trays combines learning experiences in both metal and wood, in laying out, forming, welding, drilling, and finishing of metal as well as turning and finishing of wood.

Industrial practices may be used to assist in forming and assembling the legs of the stand as explained in the procedure for making the jig.

Bending and Welding Jig

The use of a jig in bending the legs and for holding them in place during welding, insures accuracy of alignment of the parts and facilitates the assembly. Construction of the jig requires only a few minutes time and some scrap steel, and may be used for each of the three projects shown in Figures 2, 3, 4, 5, 6, and 7.

BILL OF MATERIAL

No. of Pcs.	*Material*	*Size*
1	Steel plate	¼ by 12-in. square or round
3	Hot or cold rolled steel	¾ in. dia. by 1 in. long

Procedure to make jig:

1. Locate center of 12-in. square or round ¼-in. plate and mark with prick punch. See Figure 1.

2. Lay out 2-in. and 10⅝-in. circles from center of plate using dividers.

3. Divide 10⅝-in. circle into three equal parts and mark points with center punch.

NOTE: Dividers, when set for the radius of a circle, will divide the circumference into exactly six equal chords.

4. Cut three pieces of ¾-in. diameter hot or cold rolled steel, each 1 in. long, and square up the ends.

5. Drill 21/64-in. holes through the plate at the prick marks on the circumference.

6. Clamp the ends of the round stock to the plate, centered on the holes, and weld.

7. Lay out guide lines 5/16 in. apart, centered on prick punch mark on large circle and center of circle.

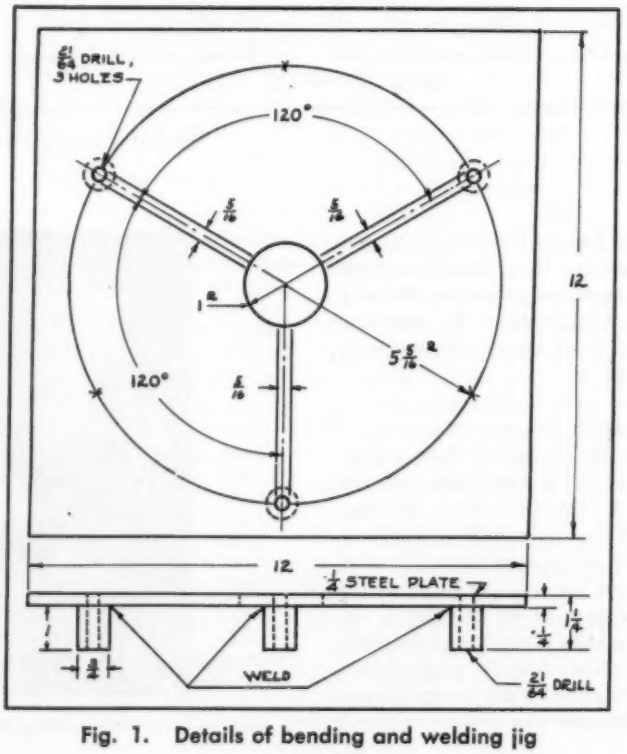


Fig. 1. Details of bending and welding jig

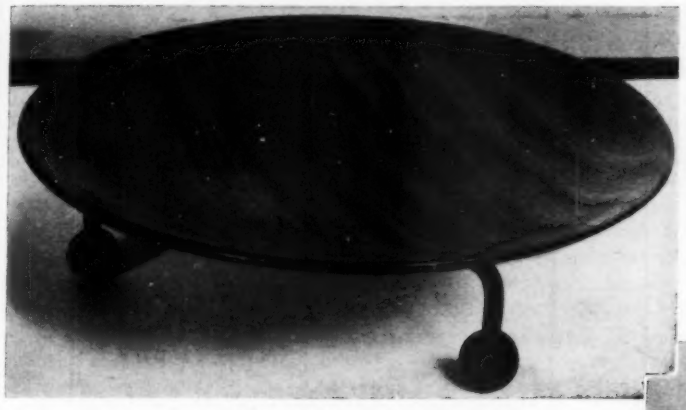


Fig. 2. Canape dish

8. Hold plate at right angles to drill press spindle and drill $^{21}/_{64}$-in. holes through round stock at points drilled in plate.

9. Cut 2-in. circle with cutting torch to prevent warpage from the welding heat and to give easier access to the under side of the joint.

Canape Plate — Figure 2

BILL OF MATERIAL

No. of Pcs.	*Material*	*Size*
3	Hot or cold rolled steel	$^{5}/_{16}$ in. dia. x $6^{5}/_{8}$ in.
1	Hot or cold rolled steel	16-ga. x 4 in.
1	Walnut, mahogany, or maplewood	$^{3}/_{4}$ x 12 in.
3	Wood balls	1-in. dia.

Procedure to Make Base:

1. Cut pieces to length and diameter as indicated on bill of material.

2. Lay out bend points as indicated in Figure 3.

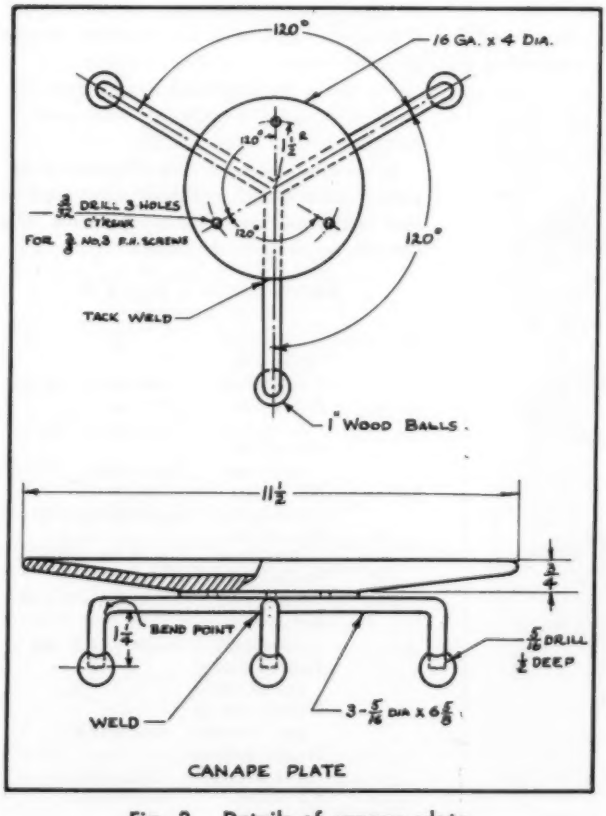


Fig. 3. Details of canape plate

NOTE: Bend points will show up best when heated if a light notch is sawed in the piece at the bend point.

3. Heat $6^{5}/_{8}$-in. pieces to a full red color about 1¼ in. from one end; place heated end in jig, and even with shaft on base of jig, and bend to a right angle.

4. Place formed legs in jig, aligning legs with guide lines on jig, and weld.

5. Lay out, drill, and countersink three $^{3}/_{32}$-in. holes equally spaced around the 16-ga. dish support.

6. Set dish support in place and tack weld as shown in Figure 3.

7. A flat black enamel or a crackle finish lacquer makes an attractive finish for the metal and sets off the wood dishes.

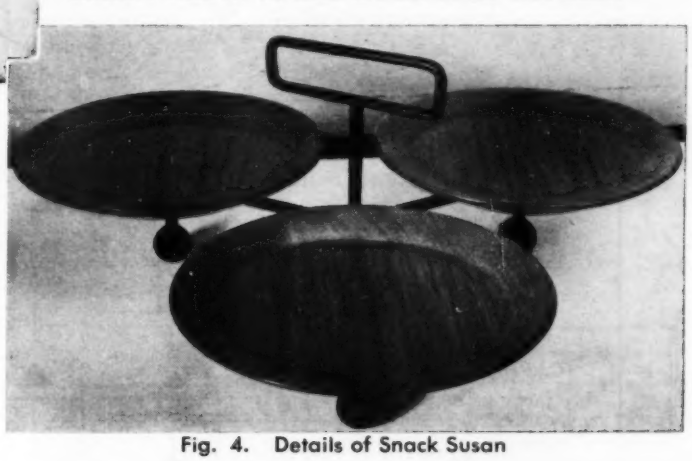


Fig. 4. Details of Snack Susan

Suggested Procedure for Making Dish:

An attractive contour for the dish is shown in Figures 2 and 3. To accommodate $^{3}/_{8}$-in. wood screws, the thickness of the finished dish base should be at least equal to lengths of wood screws.

The dish is simple faceplate turning. The stock is mounted directly on a 3½ to 4-in. faceplate.

A beautiful finish may be obtained by applying either French polish or wax. Application of the polish or wax may be made with the dish revolving in the lathe.

Snack Susan — Figure 4

BILL OF MATERIAL

No. of Pcs.	*Material*	*Size*
3	Hot or cold rolled steel	$^{5}/_{16}$-in. dia. x $6^{5}/_{8}$ in.
1	Hot or cold rolled steel	$^{5}/_{16}$-in. dia. x 3 in.
1	Hot or cold rolled steel	¼-in. dia. x 11⅛ in.
3	Hot or cold rolled steel	16-ga. x 4-in. dia.
3	Walnut, mahogany, or maple	¾ in. x 8½ in.
3	Wood balls	1 in.

Procedure to Make Base of Stand:

1. Cut pieces to length and diameter as indicated on bill of material.

2. Lay out bend points as indicated in Figure 5.

NOTE: Bend points will show up best when heated if a light notch is sawed in the piece at the bend points.

3. Heat $6^{5}/_{8}$-in. pieces to a full red color about 1¼-in. from one end; place heated end in jig, and even with shaft on base of jig, and bend to a right angle.

4. Place formed legs in jig, aligning legs with guide lines on jig and weld.

5. Place upright arm over center of base and weld.

6. Lay out, drill, and countersink three $^{3}/_{32}$-in. holes equally spaced around each 16-ga. dish support.

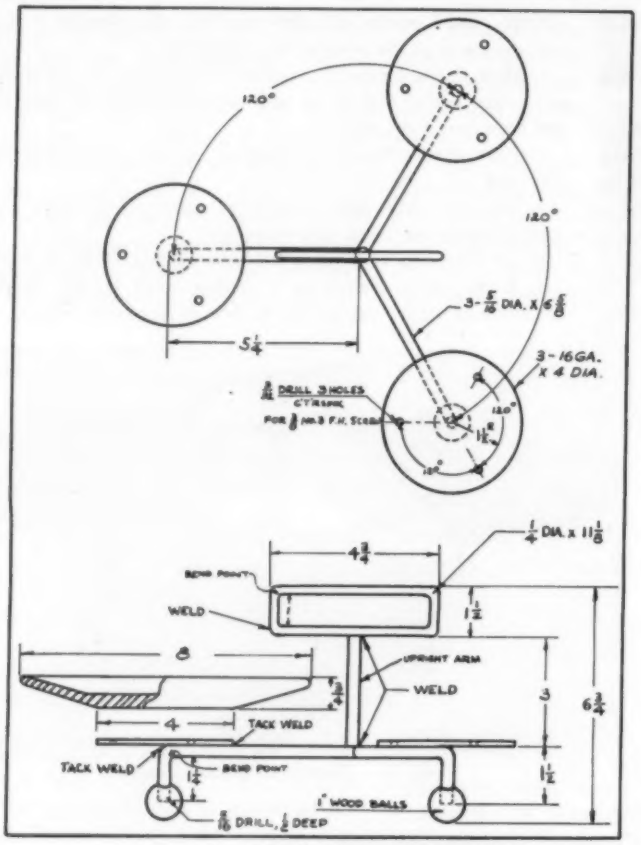


Fig. 5. Details of Snack Susan

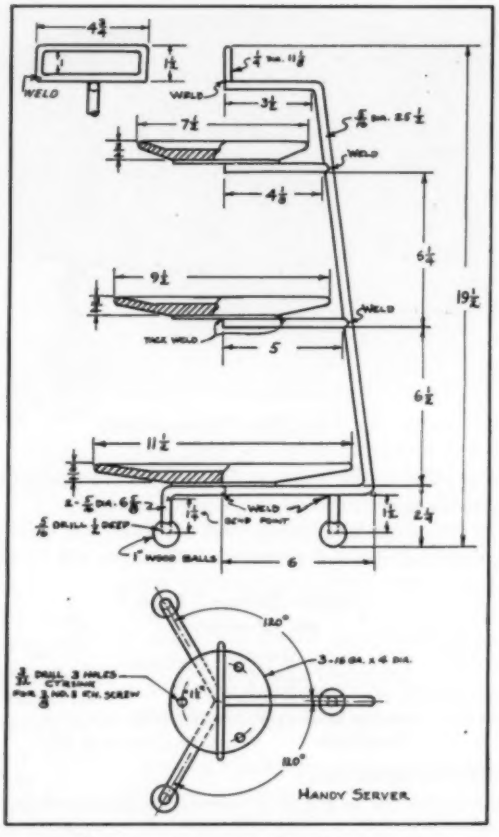


Fig. 7. Details of handy server

7. Set dish supports in place and tack weld as indicated in Figure 5.

Procedure to Make Handle of Stand:

1. Cut ¼-in. material for handle as shown in Figure 5.
2. Lay out bend points.

NOTE: Uneven widths across ends of handle may occur if weld joint is made in middle of handle. This may be overcome by making the weld at a corner as shown on the drawing.

3. Heat bend point 1 in. from one end of material; clamp in vise and bend to a right angle.
4. Heat second bend point 4¼ in. from first point, and bend to a right angle.
5. Open vise jaws to accommodate stock diameter plus a piece of 1 in. square stock.
6. Heat third bend point; clamp handle material and 1-in. square stock near one end of vise jaw so bend will clear vise, and bend.
7. Check, and if necessary, correct alignment of handle sides.
8. Weld corner.

Assembly and Finish of Handle and Stand:

1. Place handle on stand as shown in Figure 5 and weld.
2. Finish welds with round file.
3. A flat black enamel or a crackle finish lacquer makes an attractive finish for the metal and sets off the wood dishes.

Suggested Procedure for Making Dishes:

An attractive contour for the dishes is shown in Figures 4 and 5. To accommodate ⅜-in. wood screws, the thickness of the finished dish bases should be at least equal to lengths of wood screws.

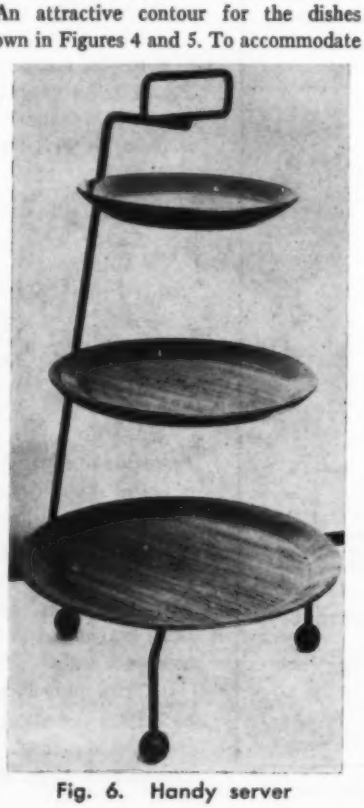


Fig. 6. Handy server

The dishes are simple faceplate turning. The stock is mounted directly on a 3½ to 4-in. faceplate.

A beautiful finish may be obtained by applying either French polish or wax. Application of the polish or wax may be made with the dish revolving in the lathe.

Handy Server — Figure 6

BILL OF MATERIAL

No. of Pcs.	*Material*	*Size*
2	Hot or cold rolled steel	5/16-in. dia. x 6⅝ in.
1	Hot or cold rolled steel	5/16-in. dia. x 25½ in.
1	Hot or cold rolled steel	5/16-in. dia. x 4 15/16 in.
1	Hot or cold rolled steel	5/16-in. dia. x 4 in.
1	Hot or cold rolled steel	5/16-in. dia. x 1½ in.
1	Hot or cold rolled steel	¼-in. dia. x 11⅛ in.
3	Hot or cold rolled steel	16-ga. x 4-in. dia.
1	Walnut, mahogany, or maple	¾ in. x 8 in.
1	Walnut, mahogany, or maple	¾ in. x 10 in.
1	Walnut, mahogany, or maple	¾ in. x 12 in.
9	F.h. screws	No. 3 x ⅜ in.
3	Wood balls	1-in. dia.

Procedure to Make Body of Stand:

1. Cut pieces to length and diameter as indicated on bill of material.

2. Lay out bend points as indicated in Figure 7.

NOTE: Bend points will show up best when heated if a light notch is sawed in the piece at the bend point.

3. Heat 6⅝-in. pieces to a full red color about 1¼ in. from one end; place heated end in jig, end even with boss on base of jig, and bend to a right angle.

4. Heat 25½-in. piece to a full red color about 6 in. from one end; clamp heated piece in vise about ⅛ in. below bend line, and form to required angle.

NOTE: A profile of the project may be drawn on a bench top or flat steel plate to facilitate obtaining the correct shape.

5. Bend upper end of 25½-in. piece as described in step 4, being careful to maintain alignment of top and bottom projections.

6. Using profile described in step 4, locate points for upper dish supports.

7. Place dish support arms on profile, clamp or block in place, and weld.

8. Place formed legs and upright part of stand in jig, aligning these parts with the guide lines on the jig.

9. Place 1½-in. piece in jig under upright part so that lower end of piece is flush with end of shaft on base of jig, and weld.

10. Lay out, drill, and countersink three 3/32-in. holes equally spaced around each 16-ga. dish support.

11. Set dish supports in place and tack weld as indicated on drawing. Either gas or arc welding could be used.

12. Finish welds to smooth, even contours, using round file.

Procedure to Make Handle of Stand:

1. Cut ¼-in. material for handle as indicated on the working drawing.

2. Lay out the bend points as shown.

NOTE: Uneven widths across ends of handle may occur if weld joint is made in middle of handle. This may be overcome by making the weld at a corner as shown on the drawing.

3. Heat bend point 1 in. from one end of material; clamp in vise and bend to right angle.

4. Heat second bend point 4¼ in. from first point, and bend to a right angle.

5. Open vise jaws to accommodate stock diameter plus a piece of 1-in. square stock.

6. Heat third bend point; clamp handle material and 1-in. square stock near one end of vise jaw so bend will clear vise, and bend.

7. Check, and if necessary, correct alignment of handle sides.

8. Weld corner.

Assembly and Finishing of Handle and Stand:

1. Place handle on stand as shown in Figure 7.

2. Finish handle welds with a round file.

3. A flat black enamel or a crackle finish lacquer makes an attractive finish for the metal and sets off the wood dishes.

Suggested Procedure for Making Dishes:

An attractive contour for the dishes is shown in Figures 6 and 7. To accommodate ⅜-in. wood screws, the thickness of the finished dish bases should be least equal to the lengths of wood screws.

The dishes are simple faceplate turning. The stock is mounted directly on a 3½ to 4-in. faceplate.

A beautiful finish may be obtained by applying either French polish or wax. Application of the polisher wax may be made with the dish revolving in the lathe.

ATOMIC-AGE KNICKKNACK SHELF

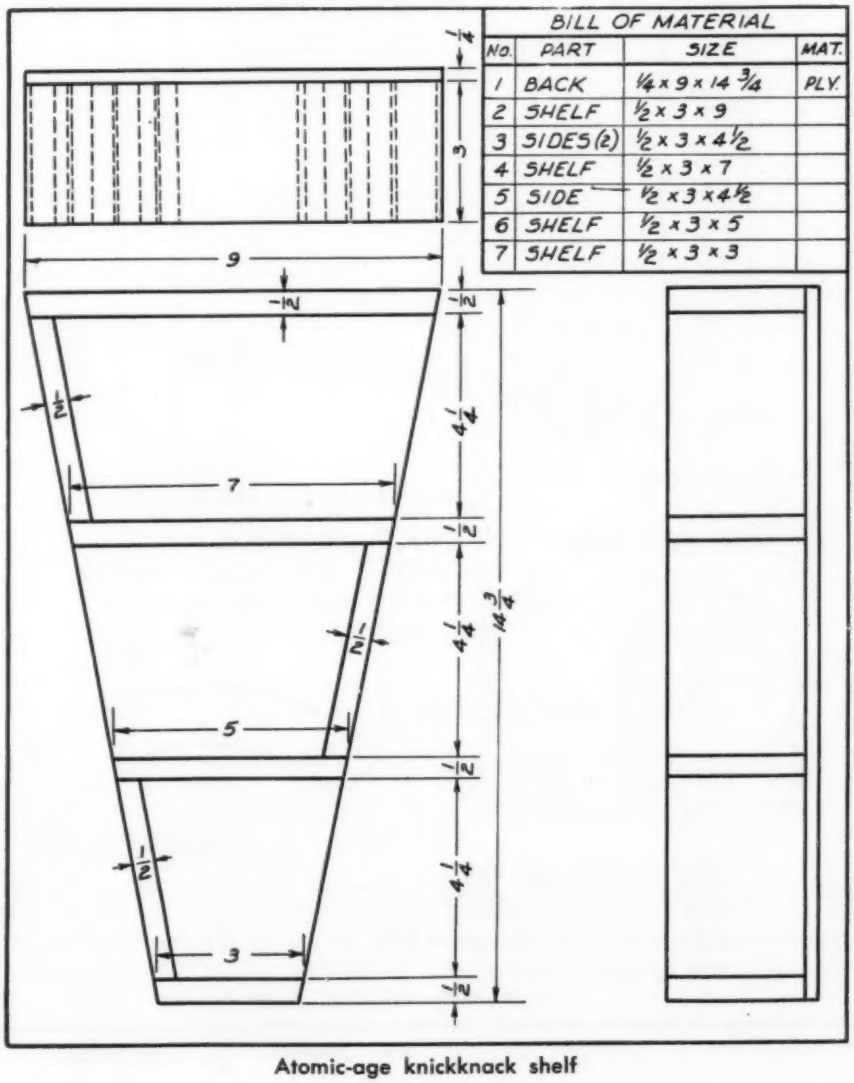
ISADORE M. FENN
Chicago, Ill.

Instructors are always looking for projects which require little material and still are attractive to their students. The simple-to-construct, streamlined, atomic-age knickknack shelf described herewith can be made with various kinds of materials, such as plastics, wood, metal, and the like. Frequently students will want to make several of these shelves which they can give away as gifts.

Directions: First, study the drawing and bill of material. Then decide on the kind of material to be used. Cut to size and shape according to the drawing. Polish or sandpaper all the pieces. The back may be made with three small pieces, if a large piece is not available. The assembly and finish depends upon the material used, so choose the proper fasteners, and finishing materials.

The students will receive valuable experiences in the planning and construction of this attractive project.

Last year, 35,500 Americans were killed in traffic accidents.



Atomic-age knickknack shelf

A CHRISTMAS CANDLE

DONALD G. LUX
Instructor, College of Education
Ohio State University
Columbus, Ohio

In late fall increased interest can often be gained through the presentation of projects related to Christmas. A candlestick offers a great variety of designs, sizes, and decorative uses, yet involves only simple layout.

A pair of the candlesticks shown on the drawing were used for exterior home decoration. A large wreath was hung on the door, and a candlestick was placed on each side of the door. The area was then spotlighted with a spotlight bulb of the type available at any electrical store.

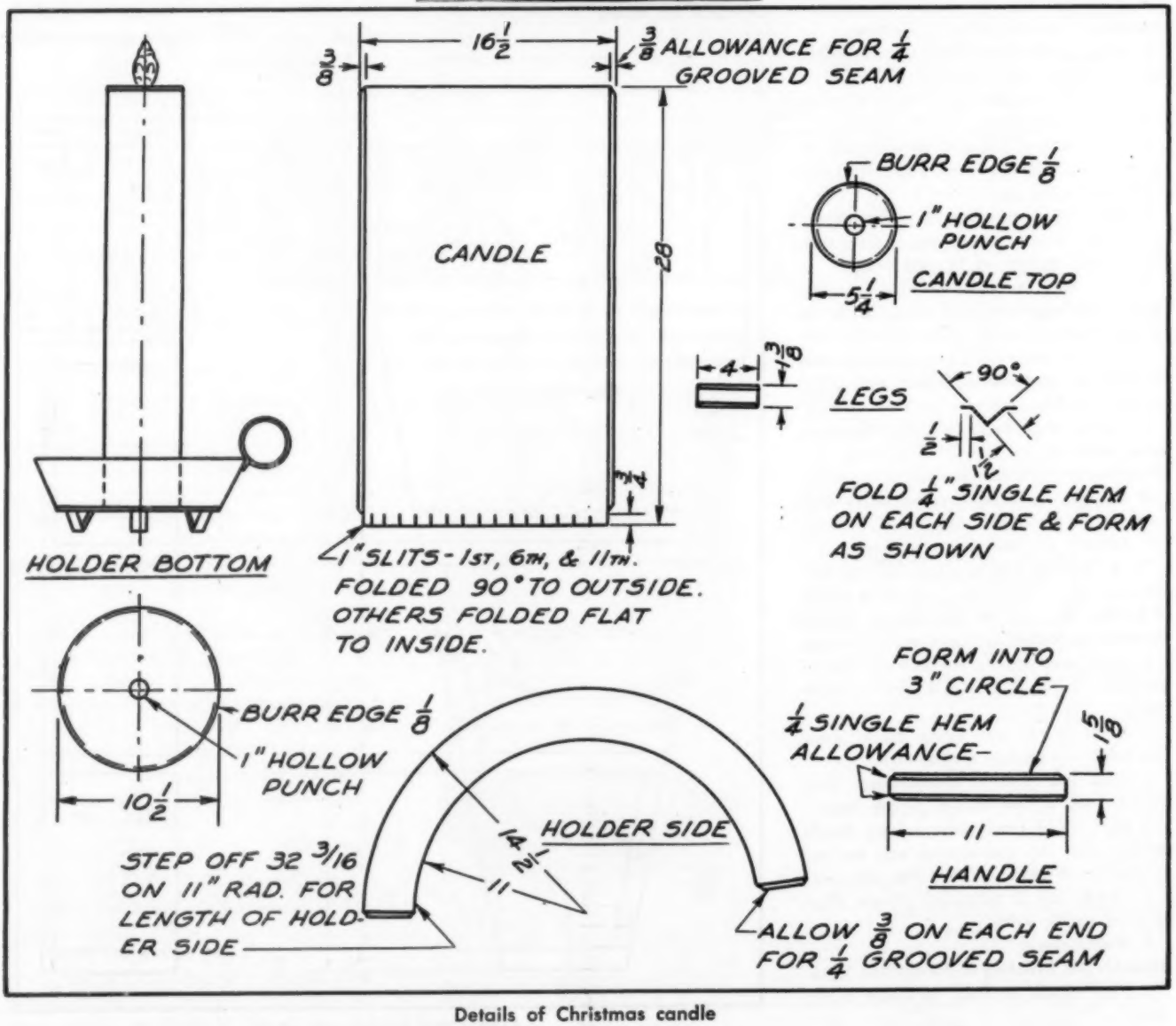
The holder was painted yellow, the candle red, and the simulated drippings were painted white. The flame was provided by an orange 25-watt bulb.

The burred candle top and burred holder bottom are tacked on with solder. The handle and feet are soldered in place, and the candle is attached to the holder with sheet-metal screws through the tabs provided. The feet are placed at 120-deg. intervals 1 in. from the outer edge of the bottom.

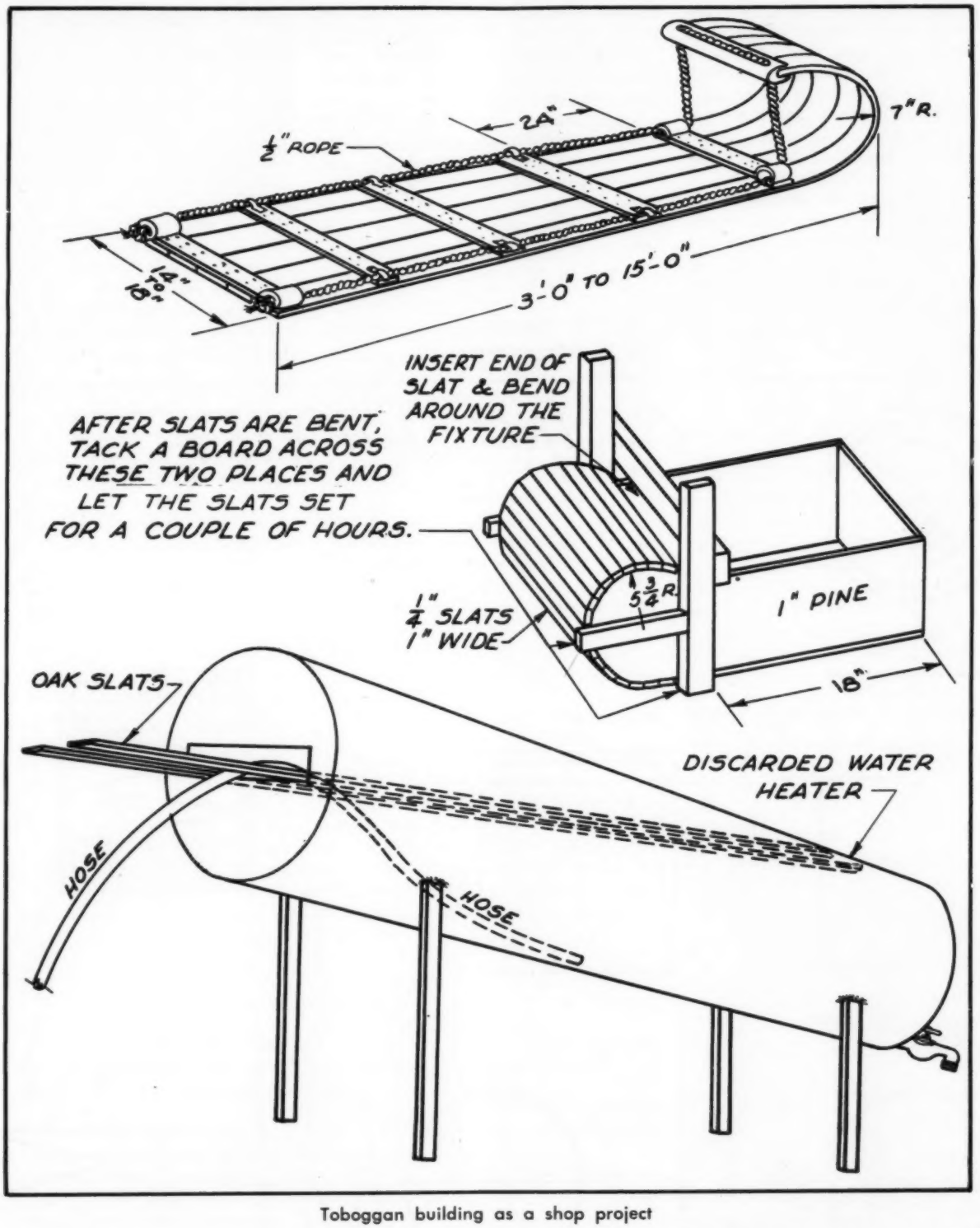
TOBOGGAN BUILDING AS A PROJECT

MARK McMILLIN
San Bernardino, Calif.

Howard Clark, cabinetmaking instructor at the San Bernardino Senior High School, has had a number of toboggans, like the one shown herewith, made by his students. These toboggans may be made either of wood or of masonite.



Details of Christmas candle



Toboggan building as a shop project

The first step in the procedure is the ripping of the slats, ⅜ in. thick and 2 in. wide, from oak planks. Following this, the slats are planed and sanded. The steam tank, which is used for steaming the slats, may be made in the school shop by removing part of one end of a discarded hot-water tank. The ends of the slats are placed in the tank as shown, and a hose carrying hot steam from the school heating plant is inserted. The wood is then treated with steam for approximately four hours, and thus made pliable so that it can be easily bent to the desired shape.

After the slats have been bent to the proper degree, they are left in a fixture for about an hour to cool off, and to *set* in their new shape. Then, since the high temperature of the steam tank discolors the oak, the slats must again be sanded.

Next the cross boards are sawed out and fitted over the ends of the slats at the front

of the toboggan. Holes are drilled and screws are driven through the holes to hold the cross boards to the main body. The side rope is then put on, and the finish sanding is done. This last is most important, as the smoother the bottom of the toboggan, the faster it will travel. The top sides are then waterproofed with shellac and varnish, and the bottom side is treated with wax, which must first be heated and rubbed into the oak bottom.

Other toboggans have been made in the class, of ¼-in. masonite. When this material is used, a different type of steam tank must be utilized as the main part of the toboggan is bent in one piece. The runners are then steamed and bent over the toboggan and riveted on.

Three runners are required. These are usually 1½ or 2 in. wide and 3/16 or ¼ in. thick. The masonite requires a shorter steaming period than the oak, and usually an hour of live steam will suffice.

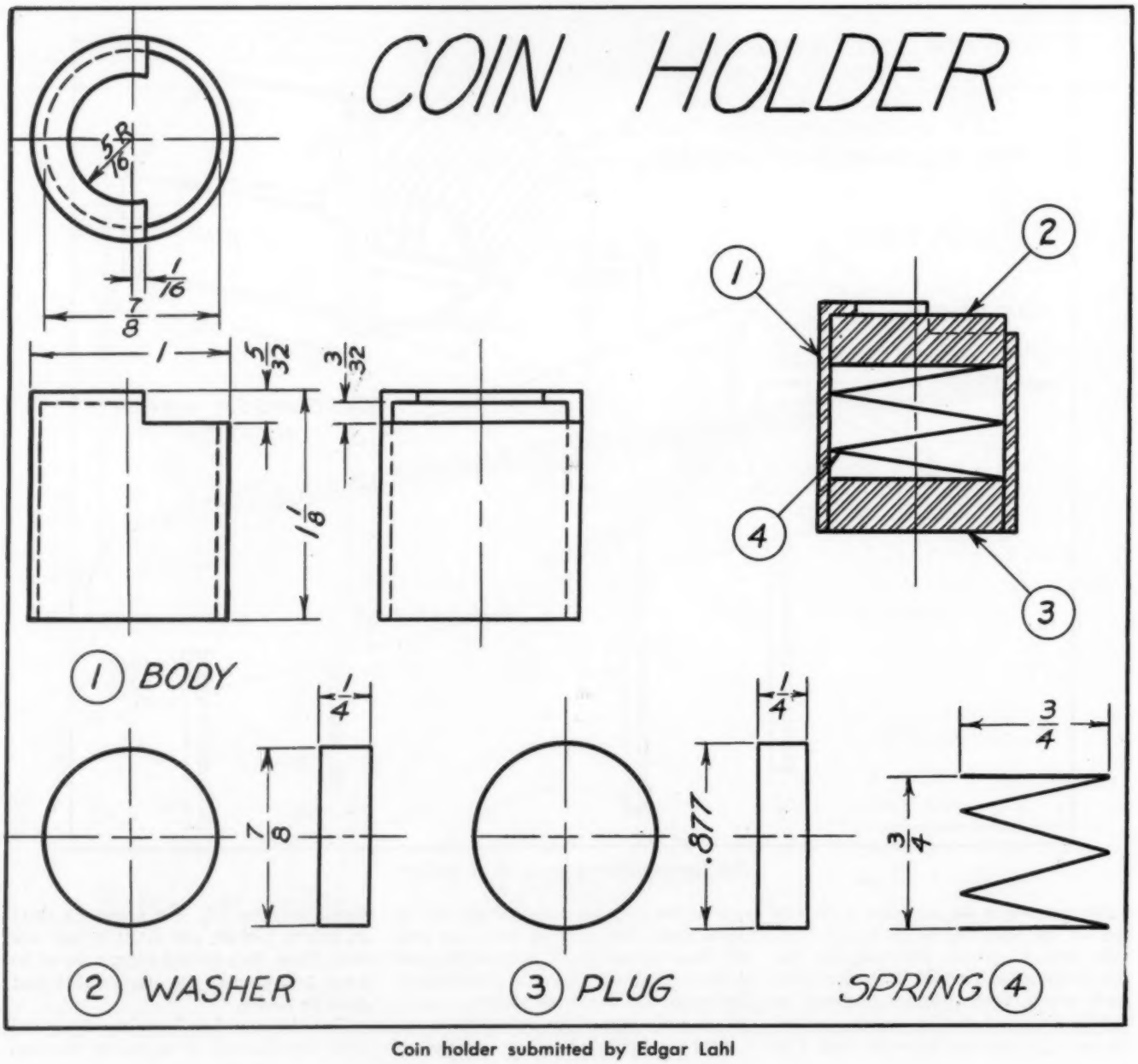
It is a good policy for the student to examine other toboggans before he starts his own. This pre-examination will give him some ideas on toboggan construction, the most desirable size, the exact width and length suitable to his needs, and other details, which he wishes to incorporate in his own work.

In 1950, 1,799,800 Americans were injured in traffic accidents.

COIN HOLDER

EDGAR LAHL
Machine Shop Instructor
Geo. Washington High School
San Francisco, Calif.

One requirement of my senior high school machine shop class each year is to develop a project which lends itself to *mass production*. This year's project was a key chain coin holder for pennies, nickels, and dimes. The project chosen is the combined effort of the entire class, not only for the choice of project and its planning, but for the entire development of the finished product. We have already found use for this project since it is handy



Coin holder submitted by Edgar Lahl

Coin holder

for storing pennies and nickels to be used in our parking meters in the city.

Early in the semester, I orient my advanced class on the subject of mass production. I tell the group how industry functions by its means. By using metal made items, we try to analyze how the particular item was made on a mass production scale. The student's interest is readily aroused in making a mass production project that will simulate procedures used in industry in our own shop.

Suggestions are made by each student as to the kind of project the class might like to make. Each suggestion is discussed in class from a standpoint of its being functional and adaptable to mass production procedures. Students consider also types of operations involved and the cost of production. One choice is made. From this point, each member of the class contributes a sketch or drawing he thinks suitable. Through combined efforts one sketch is made, and the project is ready for development. A committee of students is chosen to develop the model of the mass production product, and the class is kept posted of its development. A procedure of operations is developed by this committee including an accurate time check of each operation. A master production plan is made by assigning the various machines that are to be used, by checking both the operations that are to be performed, and the amount of tolerance allowed in making each operation or part.

A blueprint of the drawing is given each student, as well as a mimeographed operation procedure list. The committee then demonstrates to the entire class the various operations involved. At this point the class is sufficiently acquainted with the procedure to begin its actual production.

Assignments are made to class members — except to members of the project committee — who instead are assigned the positions of production superintendent and foreman. The superintendent and foreman under the instructor's direction, supervise the mass production venture, checking for tolerances, and keeping the production line running smoothly and efficiently. A production check sheet is used by each student daily. These are checked each day by the supervising committee, and a report made to the class the following day. It is interesting to watch the progress of this project, and the enthusiasm of the students once the organization is completed. Competition is created to meet or exceed the calculated time schedule per operation and still produce a part of close tolerance. Grading is based on these two factors. A point of interest to the class is the steady increase of efficiency and proficiency in the operations performed — factors which industry stresses.

Although this project lends itself very well to mass production, it may also be used as an individual project. The operations are such, that the project could be made by beginning machine-shop students.

BILL OF MATERIAL

1-in. round cold rolled steel and ⅞-in. round cold steel was used for this project. The springs were wound from .043 steel music wire. The ⅛-in. ball chain and fasteners were purchased at a local hardware supply house. The entire cost of all materials was very low.

Procedure

Body:

1. Cut 1-in. round cold rolled steel into 1 3/16-in. lengths on power hack saw.
2. Mount a piece of the steel in a 3-jaw chuck in the lathe and face both sides to the indicated length.
3. Center drill one side.
4. Pilot drill with ¼-in. drill through entire body.
5. Follow with ⅝-in. drill through entire body.
6. Rough out body with a ¾-in. drill. Avoid removing ⅝-in. lip on opposite end.
7. Set up in a milling machine and cut to a depth of 5/32 in. — 1/16-in. from center.
8. Remount the piece in the lathe, and using an end mill set in the tailstock, remove the excess metal to produce the proper shoulder on the opposite end and bring the hole to the proper size.

Washer:

1. Mount a piece of the ⅞-in. round cold rolled steel in the lathe. Using cutoff tool, cut off a piece to the proper width.
2. Set up in a ⅞-in. collet and face both sides. Break edges with a file. Polish.

Plug:

1. Mount a piece of the 1-in. cold rolled steel in the lathe, and cut the entire length to the micrometer size of .877 in.
2. With the cutoff tool, cut a piece to the proper width.

Springs:

1. Using .043-in. spring steel wire, and a piece of cold rolled steel ½ in. in diameter, mounted in lathe, run machine in reverse in slowest speed and wind springs to proper length.

Assembly:

1. Put a washer in place, backed up by a spring. Then place the plug in position, and press it into the bottom of the body with an arbor press or vise.
2. Next place it on the lathe and polish it.
3. Mount the project in V-block vise, and drill the ⅛-in. hole for the chain.
4. Polish all over.
5. Insert the chain and the coin holder is completed.

Production Check Sheet

Part: Body
Operations: Facing
Total Time: 38 min.
Average Time per Operation: 2 min., 15 sec.
Time Allotted per Operation: 2 min., 25 sec.
Plus or Minus Difference: plus 10 sec.
Tolerance: (√) Good ( ) Fair ( ) Poor
Date: 4/16/
Name: John Jones

A STRAINER FOR ENAMEL

R. L. GRANDLE
Drafting Instructor
East High School, Wichita, Kans.

Anyone that has used enamel knows that after a small portion of the can of enamel is used, no matter how carefully the container is resealed, a scum will form on its top. Sometimes this scum can be removed easily, but more often small particles of it will become mixed with the enamel making it very difficult to do a good job of enameling. Of course, one may try to strain it through various types of material such as screen wire, tea strainer, old lace curtains, and coarse muslin, but none of these proved very satisfactory.

Strainer made of a discarded nylon stocking

Nylon stocking enamel strainer

Recently I tried an old nylon stocking. I cut it in three pieces across the leg part, then tied a knot in one end, making a sort of a sack. I found by pouring the contaminated enamel into the open end and holding the hose over a clean container I had about as perfect an enamel strainer as one could hope for.

As these stockings are very strong and porous, the scum and dirt will remain inside the sack and the enamel will run into the clean container and will be in perfect condition for use. The sack is very easy to dispose of and you do not get enamel all over everything, including your hands and clothes.

This strainer will also work on varnish and paint that has either scum or dirt in it.

GLASS PAINTING FOR THE HANDICRAFTS PROGRAM

H. F. HODGENS
Hollenbeck Junior High School
Los Angeles, Calif.

Painting on glass is not new, but several innovations can be introduced to make glass painting very interesting. This simple craft requires a minimum of tools and materials and introduces the possibility of producing attractive, useful decorations for such projects as small serving trays, glass ash trays, TV lamps, and glass picture tops for coffee tables. The only limiting factor to glass painting is that the back of the design must be covered.

The following materials will be needed:

1. Glass — any size or shape.
2. Set of poster paints or enamels — the solid colors.
3. Set of Crystalac paints — the opalescent colors.
4. Black India ink and a straight pen.
5. Brushes.
6. Aluminum or tin foil.

The following procedure is suggested in making glass painted pictures:

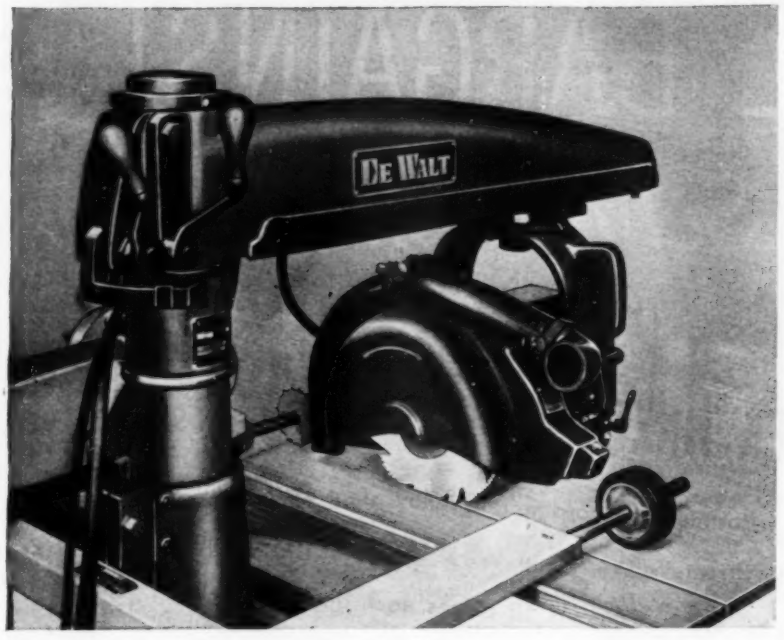
1. Obtain glass in the desired size. Students in the younger groups may wish to purchase inexpensive frames with the glass included. Advanced students, however, may wish to tackle the job of making the completed frame.
2. Draw or trace a satisfactory design. (Copper tooling designs work well; and children's coloring books are good sources for designs.)
3. Trace the design on glass with the waterproof India ink. Let ink dry about five minutes.
4. Begin painting (on the inked side) with the solid colors such as the poster paints or enamels. The poster paints work very well, because they dry quickly, do not tend to smear, and may be washed off the glass in case of an error.
5. After other paints have dried, use the Crystalac paints for color areas that you wish to be opalescent. Leave uncolored any area that you wish to show as silver from the aluminum foil, such as clouds, snowbanks, and the like. Let these paints dry at least ten minutes.
6. Cut the aluminum foil (such as is used for cooking or in the packaging of some breakfast cereals) slightly larger than the glass. Wrinkle it carefully so as not to tear it and place on the painted side of the glass.
7. Put the glass into the frame with the wrinkled foil as a background.
8. Replace cardboard backing and the frame nails and the job is completed.

The decoration of ash trays involves an additional step. The foil must be cut, care-

(Continued on page 21A)

Students showing their glass paintings made in Mr. Hodgens' class

TRAIN YOUR STUDENTS ON A DE WALT



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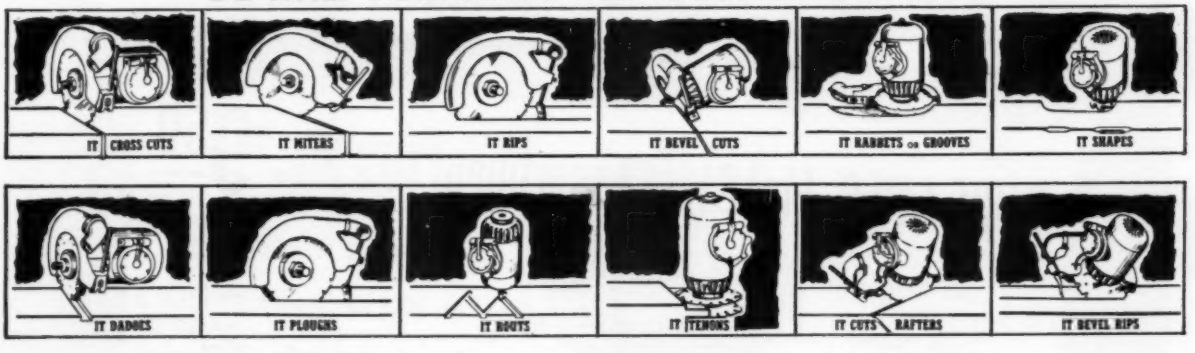

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Finest quality assortment of carbon and alloy steel Bars from 3/16" to 1/2", Flats from 1/8" x 3/16" to 1/4" x 1/2", Seamless tubing from 1/4" to 1 5/8" O. D. Contains 12 pieces each approximately 36" long. Students can make or repair thousands of items!

SURE SPEC Flat Steel Assortment 100 lbs. $9.50

This high quality Sure Spec flat steel package contains Hot Rolled, Cold Rolled and Coated rectangular pieces of 100 sq. inches and larger, from 1/16" in thickness and lighter. This is the only utility flat steel pack for school shops on the market!

Immediate delivery. Satisfaction is Guaranteed. Terms 2%, 10 days, 30 days net. F. O. B. Cleveland, Ohio. Send your orders to

SOLAR STEEL CORPORATION

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Union Commerce Bldg.
Cleveland, Ohio

"for service dependable as the sun"

GLASS PAINTING

(Continued from page 354)

fully, together with a small piece of cardboard or sheet cork as a back (or bottom) and then glued or taped to the tray bottom.

A unique effect may be obtained by painting on the glass sides of an interior lighted TV lamp body. The background color should be applied very thick so as to allow the light to show through the Crystalac (opalescent) areas only.

Before the student begins the actual glass painting — check these points!

1. The pattern or picture will be reversed when painted on the glass. The painting is done on the back of the glass and viewed from the front side.

2. Plan the colors and the type of paints that will gain the best effect. Mark on the tracing the color desired before painting.

PERSONAL NEWS

(Continued from page 8A)

He holds membership in Phi Delta Kappa, Epsilon Pi Tau, Iota Lambda Sigma, Mu Sigma Pi, National Society for the Study of Education, National Education Association, American Vocational Association (life member), Wisconsin Education Association, Wisconsin Industrial Arts Association (chairman of State Curriculum Committee), Mississippi Valley Industrial Arts Conference, Northwestern Wisconsin Teachers Association, and National Association of Industrial Teacher Trainers.

Dean Bowman will be given the title of dean emeritus of industrial education upon his retirement.

The Stout Institute also has honored him by calling their industrial-arts building — *Bowman Hall.*

JOHN JARVIS SUCCEEDS CLYDE A. BOWMAN

John A. Jarvis, who has been on the faculty of The Stout Institute for some time, will succeed Clyde A. Bowman as dean of the division of industrial education.

Mr. Jarvis was graduated from the high school in Janesville, Wis., in 1926.

He holds a B.S. degree in mechanical engineering from the University of Wisconsin, a B.S. degree in industrial education from The Stout Institute, a M.Ed. in industrial education from Wayne University, and has completed all the work for a Ph.D. degree, except the dissertation at the University of Minnesota.

He taught general shop and patternmaking at Flint, Mich., 1936–42. In 1942 he was appointed teacher trainer at the Armored Force School, Fort Knox, Ky.

On August 8, 1942, he entered the naval service and was released to inactive duty as a lieutenant commander on December 26, 1945.

Then he worked in the engineering departments of the Chevrolet Motor Company and the A. C. Spark Plug Company. After that he accepted the appointment as associate professor of industrial education.

John A. Jarvis

PHILIP M. WAGNER RETIRES

After completing 49 years of service with the Newark, N. J., board of education, Philip M. Wagner closed his career as educator by retiring in June, 1952.

He was born in Newark and received his early education there. He was graduated from the architectural department of the Newark School of Fine and Industrial Arts, and attended Teachers College, Columbia University, and Rutgers University.

He served as chief clerk in the office of the superintendent of schools at Newark from 1903 to 1913. Then he was appointed teacher of manual training and mechanical drawing in the Cleveland Elementary School. In 1928 he became teacher of mechanical drawing at the

(Continued on page 24A)

SHELDON
CHICAGO U. S. A.

These 3 quality machine tools are especially adapted to school use because of their:

AMPLE SIZE — permits wide range of practical projects.

STANDARD DESIGN — true industrial tools with standard controls.

PERMANENT ACCURACY — these tools hold their accuracy under student abuse, do not require constant rebuilding and servicing.

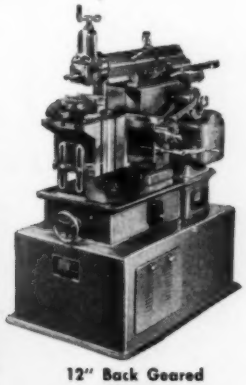
SAFETY — all drives completely enclosed; all speed changes made by external levers.

PRICE — these are moderate priced tools that school shops can afford.

Write for the SHELDON Catalog showing and describing (with complete specifications) the line of: SHELDON Precision Lathes (9", 10", 11", and 13" Swing), Sheldon Milling Machines, Sheldon Shapers and Sheldon Machine Tool accessories and attachments.

Horizontal Milling Machine

No. T556B 11¼" Swing Lathe



12" Back Geared Shaper

SHELDON MACHINE CO. Inc.
Manufacturers of Sheldon Precision Lathes • Milling Machines • Shapers
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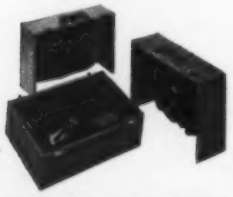
Kodascope *Pageant* Sound Projector lists at only **$400**

. . . complete in one case with single speaker for classrooms and small auditoriums



MULTI-SPEAKER UNIT . . .
Matching case with three extra speakers for large auditoriums or to overcome poor acoustical conditions . . .
Lists at only **$92.50**

Prices subject to change without notice.

Of all the causes of projector breakdowns, Audio-Visual experts agree improper lubrication is the number one—by a big margin. (See statements opposite.) They will also tell you that the Kodascope Pageant Sound Projector is the one 16mm. sound projector that eliminates this worry . . . *it's the only machine permanently lubricated at the factory!*

This achievement didn't just happen. It's the result of a fresh approach by Kodak engineers on the over-all design of motion-picture projectors. Out of this came the idea of using oil-impregnated bearings, sealed-in-oil bearings, "lifetime" oil-retaining pads, low-friction nylon gears, and a minimum of moving parts. *Trouble-free operation is built into the Pageant!*

But to really satisfy yourself on *all* points of Pageant superiority, ask your Kodak Audio-Visual Dealer for a demonstration. Then you can hear its fine tonal results from all types of 16mm. optical sound films . . . see its sharp, corner-to-corner screenings . . . note the sound quality you get at all volume levels . . . appreciate how adaptable it is for small- or large-audience showings. If you're not as yet acquainted with your Kodak A-V Dealer, please fill out and return the coupon at the right—today.

CHECK THE PAGEANT ON ALL POINTS . . . YOU'LL SOON SEE WHY IT'S PREFERRED

- Trouble-free operation
- Undistorted sound at all volume levels
- Brilliant, crisp screen images
- Easy threading . . . any student can do it
- Compact, easy to carry, simple to set up

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A-V experts agree, prove projector maintenance worries!

"... Our service records show that 73% of the service work which we have done was necessary primarily because of the lack of oil or too much oil ..."

Carl M. Loftis, *Executive Vice-President*
Audio-Visual Supply Co., Inc., Laguna Beach, Calif.

"... Of all causes of equipment breakdown, lack of regular lubrication is far in the lead. Needless to say, the 'pre-lubrication' feature of the Pageant is welcome news to schools and to all other organizations in which the motion-picture equipment is operated by a number of different persons ..."

Franklin R. Crawford
Crawford and Immig, Inc., New York, New York

"... We didn't realize what a good feature you had in permanent lubrication until we sold some Pageants to schools. While other makes have been sent back for lubrication and cleaning, we have yet to see the first Pageant. Believe us, the schoolman likes that kind of performance ..."

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Miller's Visual Aids, Inc., Fort Worth, Texas

"... Any organization that has more than one person using its sound equipment is sure to be enthusiastic about the fact that the Kodascope Pageant Sound Projector is 'lubricated for life.' They know that their equipment will never be out of service because someone forgot to lubricate it. ... This has been our biggest help in placing Pageants in schools and industrial organizations ..."

W. D. Morrow
James Lett Co., Harrisburg, Pennsylvania

"... Here's a startling fact even I wouldn't have believed, hadn't our own records proved it. *Not one* Pageant sold by our company has required major 'after-sale' repair or adjustment! Since over- or underoiling is the prime reason for projector breakdown, we're satisfied that the Pageant's permanent-lubrication feature deserves the credit for this remarkable 'continuous duty' performance ..."

Mrs. Ruth B. Walsh, *President*
James E. Duncan, Inc., Rochester, New York

"... Central California educators have found projector lubrication unnecessary, inefficient, and time consuming—that's why more new Pageant Sound Projectors are being sold here than any other ..."

Galen Larson
Fresno Camera Exchange, Fresno, California

This will get you a FREE demonstration

OTION PICTURES
teach, train, entertain

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☐ ***Please have nearest Kodak Audio-Visual Dealer contact me about a Pageant demonstration.*** ☐ ***Send complete information on the Kodascope Pageant Sound Projector.***

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Kodak

PERSONAL NEWS

(Continued from page 21A)

South Side High School and later at the Weequahic High School. He also served as faculty adviser of athletics for many years.

He also worked evenings at the Newark School of Fine and Industrial Arts beginning in 1908 and serving continuously for 44 years.

He was a very active member of a number of educational organizations, such as the New Jersey Vocational and Arts Association, Newark Teachers' Association, Essex County Arts Association, School Crafts Club of New York, and others.

His co-workers feel that retirement for him will merely mean greater opportunity for more service given with greater zeal and vigor.

Philip M. Wagner

LESLIE G. STIER DIES

Leslie G. Stier, director of the Los Angeles Trade Technical Junior College and for three decades a leader in industrial education, died at the age of 59 on July 30, after a 6-month illness.

Mr. Stier was a vocational education research agent for the University of California, a vocational education instructor in teacher training at UCLA, a special agent in trade and industrial education for the U. S. Office of Education, and instructor at the University of Utah during his long career in education.

♦ Dr. Joseph Strobel, U. S. Assistant Commissioner of Vocational Education, and Dr. M. D. Mobley, executive secretary of the American Vocational Association, were featured speakers at the 1952 joint conference of the U. S. Bureau of Apprenticeship and the State Apprenticeship Agencies. The conference was held August 20 to 22 at Washington, D. C.

♦ Dr. Harry W. Paine, former head of the department of vocational education at the University of Cincinnati, is now with the Institute of Inter-American Affairs in the Republic of Panama.

♦ A. J. Ostergaard has been made head of the vocational drafting department and vocational drafting co-ordinator at Omaha Technical High School, and also a member of the industrial arts committee for the Omaha Public Schools.

♦ Jamie R. Wommack, former assistant state director of vocational education and state supervisor of distributive and trade and industrial education of Georgia, is now serving as director of vocational education in Paraguay.

Mr. Wommack was appointed to his new position by the Institute of Inter-American Affairs, U. S. Department of State.

♦ Dennis H. Price, formerly at Indiana State Teachers College, Terre Haute, Ind., has been made head of the department of vocational education at the University of Cincinnati, Cincinnati, Ohio, to take the place of Dr. Harry Paine who is now with the Institute of Inter-American Affairs in the Republic of Panama.

♦ H. L. Oakley, head of the department of industrial arts at Murray State College, Murray, Ky., is now on leave of absence to pursue work on the doctoral level at the University of Missouri.

Marion A. Brown is substituting for him at this time.

News Notes

♦ On May 19, 1952, the Board of Regents of the University and State Colleges of Arizona authorized the Arizona State College at Tempe to grant the degree of Doctor of Education. The program of graduate work leading to the degree was offered for the first time during the summer session of 1952.

♦ S. C. Johnson & Son, Inc., Racine, Wis., have available a booklet on floor safety, titled "Facts." You may want a copy.

(Continued on page 26A)

"So Comprehensive"..."The Finest Booklet Of Its Type We've Ever Seen"

INSTRUCTORS... USE THIS VALUABLE AID TO CLASS INSTRUCTION... IT'S FREE!

You must see and read this booklet to appreciate why instructors hail it as an outstanding contribution to vocational education. Comprehensive, completely illustrated, it tells the story of precision measuring in a simple way that appeals to all students.

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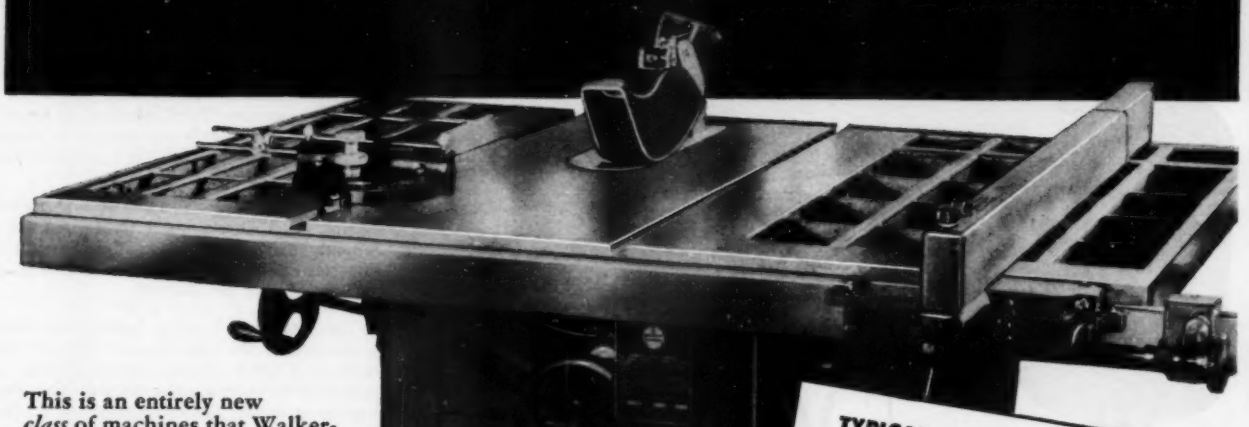
Industry welcomed them—and so will you! . . .

the new WALKER-TURNER line of LIGHT-HEAVYWEIGHT Machines



This is an entirely new *class* of machines that Walker-Turner has designed. *Light-heavyweights.* "Made to order" for the school shop, where neither the capacity nor expense of heavy industrial machinery is warranted (yet where the hobbyist's power tools would be totally inadequate).

The new Walker-Turner Light-Heavyweight line gives industrial arts and vocational schools for the first time the machine accuracy, speed, ease of operation, and safety features required for student training, *without the necessity of heavy investment.*

For complete information, use the margin below to write your name and address. Clip and mail at once.

SOLD ONLY THROUGH TRAINED INDUSTRIAL DISTRIBUTORS

TYPICAL LIGHT-HEAVYWEIGHT 10" WALKER-TURNER TILTING ARBOR SAW

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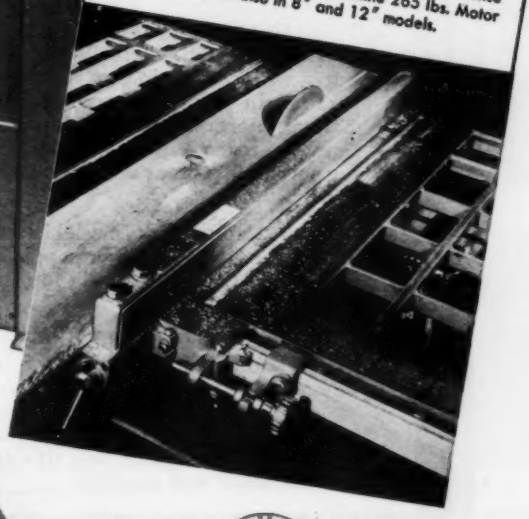

Use this space

to send for full details and specifications.
Walker-Turner Division, Kearney & Trecker Corp.
Educational Dept. IA-12, Plainfield, N. J.
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FOR FASTER, EASIER SOLDERING-

*Snap-on BRINGS YOU THE NEW VARI-HOT Electric Soldering Iron

2 Models $7.75 Each

2-Speed Element Reaches Soldering Heat In 40 Seconds

This 110-115 volt AC-DC iron goes to work FAST! Pressing the button shoots a booster charge of 100 watts within the tip—brings it to soldering temperature in just 40 seconds! Then, only 25 watts maintain normal tip temperature comparable to conventional irons drawing 100 watts. For heavy soldering jobs full current is always available by pressing the button.

A 28-32 volt AC-DC model is available for aviation use off the airplane power supply, it draws 3.6 amps in high heat and 0.9 amp in idling heat.

The Vari-Hot iron is *light*... only 10 ounces—a boon in continuous soldering operations! Adjustable rest on shaft permits laying iron down with no danger of burning surfaces or starting a fire. Shockproof Durez handle. Tapered chisel type tip plated with "Vanderloy" provides extreme durability to tip. Other type interchangeable tips are available. Write for literature and catalogs.

*Snap-on is the trademark of Snap-on Tools Corporation

SNAP-ON TOOLS CORPORATION
8074-L 28th Avenue, Kenosha, Wis.

NEWS NOTES

(Continued from page 24A)

♦ Fifty schools in Nassau and Suffolk Counties exhibited about 3500 student industrial-arts projects at the Long Island Industrial Arts Exposition held in the Calkins gymnasium, on the Hofstra College campus, Hempstead, L. I., last May.

Projects in auto mechanics, agriculture, building, construction and architectural drawing, mechanical drawing, ceramics, weaving, leathercraft, metalcraft, woodworking, electricity, radio, aeronautics, printing, plastics, machine shop, jewelry, and many other fields were among the articles displayed.

This was the fourth consecutive year that Long Island's industrial firms gave their support to the industrial exposition. The Committee on American Principles and its chairman have been constant supporters of education and the building of youth in the American way of life.

Student bands, glee clubs, and musical organizations provided entertainment throughout the exposition. WSHS, Sewanhaka High School's FM radio station, broadcast special events with student engineers at the controls.

♦ The American Welding Society has selected the winners of the 1951–52 A. F. Davis Undergraduate Welding Awards which include cash prizes of $700 and award certificates. This annual program is named for its sponsor, A. F. Davis, vice-president and secretary of the Lincoln Electric Co., Cleveland, Ohio.

♦ Two Cornell University undergraduate engineers, Paul J. Wisniewski and David A. Thomas, won the first prize of $200 with their paper entitled "Metal Transfer in Arc Welding" which appeared in the April, 1952, issue of *The Cornell Engineer*.

A Wisconsin senior, Norman Fletcher, has been selected as winner of the second prize. His prize-winning paper on the subject of "Arc Welded Machine Jigs" was published in the November, 1951, issue of *The Wisconsin Engineer*. Mr. Fletcher will receive $150 for second prize.

♦ "The Hobby Fair"—a continuous, year-around exhibit of all types of hobbies—opened in New York City in September.

It is located at 3 East 14th St., just off Fifth Avenue. It is sponsored by the Hobby Advisory Council of America, which has offices at the same address.

Many unique and timely features are to be scheduled. Besides arts, crafts, collections, and models, exhibits will cover other types of recreation and leisure-time activities. These will include sports, pets, games, reading, writing, music, and natural history. Some of the displays will be changed weekly.

♦ Skin diseases annually cost industry one hundred million dollars, the West Disinfecting Co. points out in its new 32-page booklet, "The Control of Dermatitis in Industry."

The new booklet presents a simple, inexpensive prevention and control program for guaranteeing personal cleanliness, protecting exposed skin areas, preventing clothing contamination, and guarding against special hazards.

Copies of "The Control of Dermatitis in Industry" may be obtained by writing the *West Disinfecting Co., 62–16 West St., Long Island City 1, N. Y.*

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Benchmaster converts from vertical to horizontal milling simply by exchanging spindle assemblies. Accuracy meets regular commercial machine tool requirements.

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FULL LINE OF ACCESSORIES for use with Benchmasters: 6" Rotary Table, 4" Swivel-base Vise, Pedestal Base, Splash Tray, Drawbar Collets from 1/16" to 1/2" in fractional steps.

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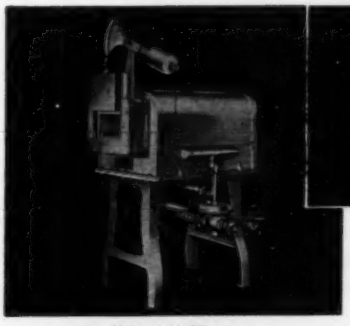

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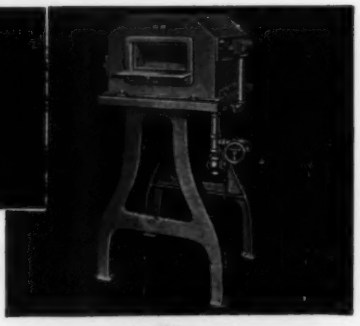
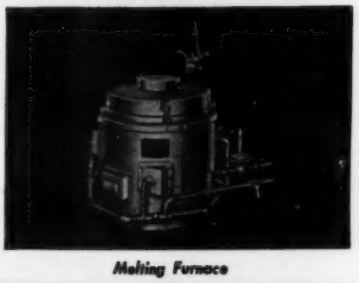


Small Forge

HUNDREDS OF THESE SUNBEAM STEWART FURNACES ARE IN THE VOCATIONAL DEPARTMENTS OF TECHNICAL SCHOOLS

Round Pot Furnace

Because Sunbeam Stewart units have been designed for efficient production heat treating in small shops and tool rooms, they are widely recognized as standard equipment for all types of industrial heat treating and vocational training work. For student instruction and reference, write for our free "Guide to Furnace Selection." Aids in determining the type of furnace best suited for any work. Also ask for the new Data File on school units.



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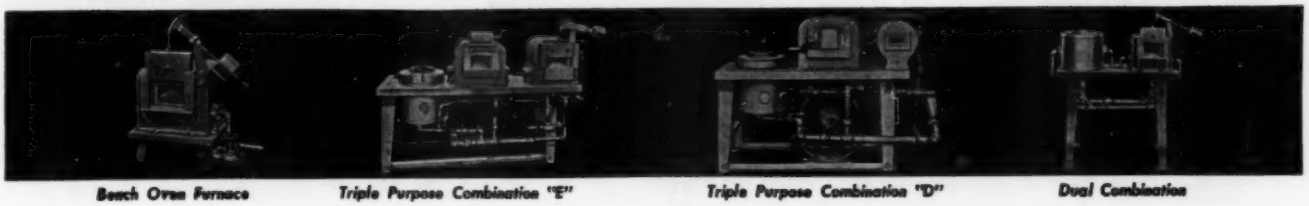


Bench Oven Furnace *Triple Purpose Combination "E"* *Triple Purpose Combination "D"* *Dual Combination*

New Publications

A REVIEW OF A REPORT

PROFESSOR HOMER J. SMITH
University of Minnesota

The historical report* here under review is one of the most recent productions of one of the best known and most competent students and writers in the industrial education profession. There is real justification for such coverage in INDUSTRIAL ARTS AND VOCATIONAL EDUCATION because of the author's unusual interest and care in the identification of beginnings and in the tracing of developments in our field; also, because of the initial nature and the continuing status of the college in question among preparatory and upgrading centers for workers in our curriculum area.

Kansas State Teachers College, Pittsburg, was opened in 1903 in administrative setting with the older State College at Emporia and with an interesting and suggestive designation as the Auxiliary Manual Training Normal School. Attaining lone identity ten years later, with constant broadening of its offerings and services yet with dedication to its inceptive function, Pittsburg now holds high rank in special-fields teacher training. It was, in fact, "The first state institution established at public expense for the express purpose of the preparation of teachers of manual training, domestic science and domestic art."

Dr. Bawden has skillfully employed the usual historical techniques and compiled a report naturally of prime interest to alumni, faculty, and friends of the college. The volume is replete with step-by-step details of physical and professional change — with concrete mention of personalities and programs, of provisions and rulings, of circumstances and events — all certain to make it a treasure for many and to enlist their aid toward the institution's brightened future. A section of the appendix material will be especially prized — 31 brief sketches of the lives of individuals prominent through the years in the making of the history being reported.

Here, also, those interested in the specifics of college development and administrative patterns and problems will find reading hours of good return in terms of comparison and added perspective.

Industrial education personnel will find much of interest and aid, in that the author has provided a measure of the history of our movement as well as of the part played by our special type of work within the one institution. Chronological treatment is afforded of many phases of our growth and there is mention of cities, schools, colleges, and practices that are within our sketchy knowledge. Likewise, many men who are known to us as early or current leaders are mentioned because their efforts have led to or have been in connection with things being factually reported concerning the college.

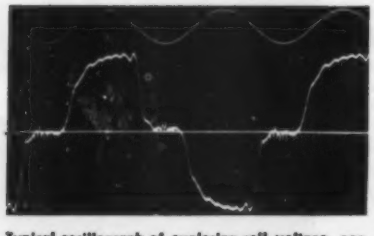
There are four chapters about the broad and general development of education in state, county, and community with much included that all should know as a matter of historical record. Four later chapters cover the successive administrations of as many heads of the college. The narrative is brought to the first year of the term of the present leader, President Rees H. Hughes, who suggested the study and who prepared an introductory statement. Other chapters include details on many matters of concern to all types of readers — varied phases of college plans and activities covered with worth-while depth.

As a whole the report will have personal appeal to thousands of those who know the college. It will serve as a pattern and guide for those who would attempt similar pieces of work. It will afford satisfaction and clarity of understanding to those persons of industrial education attachment who tend to base the

(Continued on page 31A)

*Bawden, William T., *A History of Kansas State Teachers College*, 1903–1941 (Pittsburg, Kans. [The College], 1952), pp. 316.

GE exploring coil GENERATOR



Typical oscillograph of exploring-coil voltage, normal excitation, full-load.

Professor F. Wahler of the Polytechnic Institute of Brooklyn, N. Y. says:
"The spontaneous enthusiasm shown by students using this exploring-coil generator to study armature reaction, proves that it is a 'must' for all electrical machinery laboratories."

The exploring coil is isolated from the armature circuit electrically, but is subject to the same flux as the armature winding. Only one side of the exploring coil is in a conventional armature slot. The other side lies in a special groove in the armature shaft and this side of the coil is not in the flux path. In effect, the exploring coil gives a true indication of a single conductor cutting the flux of the machine.

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New BERGER drafting kit for students will make your teaching job easier... help your classes learn faster

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It's easier to bring all these tools to class than to leave any at home!

With this new, all-in-one drafting kit, your students will really be "present" in class, fully-equipped with every tool they need... every day. Your sessions will get under way promptly. No interruptions by students tapping on their neighbors' shoulders—no piercing whispers begging the loan of a protractor, a triangle, a scale.

The Berger Drafting Kit is complete. It includes: your choice of 8 different sets of drawing instruments, protractor, architect's scale, engineer's scale, 8" and 10" triangles, French curve, draftsman's tape, pencils, pencil pointers and erasers. Inner compartments hold drawing and note papers—all in attractive, durable, 16"x 24" simulated leather carrying case of scuff-proof, waterproof Texon.

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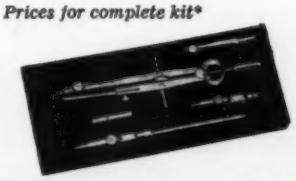
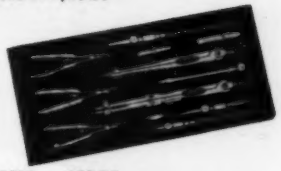
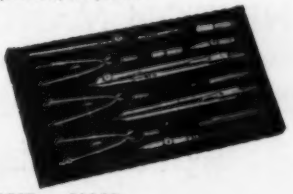


T-710A—Super-size bow combination with interchangeable pen, pencil, divider parts. Bow 6½" long. Circles to 8½" diameter... **$11.38**

S-510... $13.35



C-2400... $17.34
Available with side wheel bows (S-2400)... **$16.77**



T-708... $14.80
Available with side wheel bows, without divider (T-608)... **$12.78**

Drawing sets are precision-made in American Zone of Germany. In velvet-lined cases.

**Prices quoted are for quantities of 6 or more kits. Instructors may buy sample kit at same low price.*

INSTRUCTOR'S ORDER BLANK

Please send me the following Berger Drafting Kits:

Check enclosed ☐ Money order encl. ☐

Quantity	Set No.	Price

Name.....

School.....

Address.....

City..... *Zone*..... *State*.....

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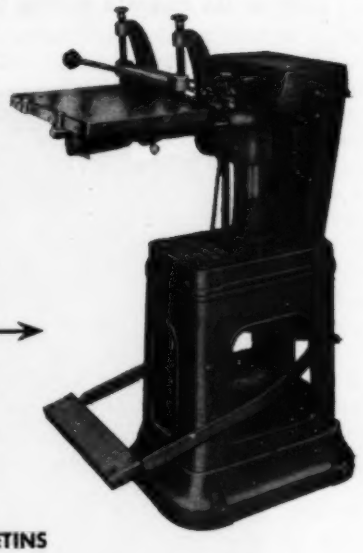
The Model E-30 OSCILLATING UNIVERSAL EDGE SANDER at left is just the tool for the wood shop. Platen area is 8½" x 30" on each side, using an 8" x 77" abrasive belt. The work table is extra large — 22" x 52", the back half of which tilts for angle sanding. The entire workhead oscillates, and is powered by a 3 H. P. direct-drive totally enclosed motor.

Also available in a smaller model having a 6½" x 18" Platen.

Precision Dowel Joining of wood parts is easy with NEWTON TWO-SPINDLE BORERS. The B-600 Model shown at right is one of four different sizes available, including an Air-Operated model. These machines will bore two holes on any centers from 1⅝" up to 7¼", with a bit capacity up to ¾". The spindles are of heat treated alloy steel mounted on precision ball bearings for high speed operation.



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NEW PUBLICATIONS

(Continued from page 28A)

present and the future upon the trials and successes of the past.

Occupational Information

By Carroll L. Shartle. Cloth, 425 pp., 6⅛ by 9¼ in., illus., $5. Prentice-Hall, Inc., New York, N. Y.

A helpful book for those whose duty it is to develop and use occupational information.

The present revised edition has been brought up to date and contains much additional material based on recently prepared occupational information.

The chapter headings give an indication of how the subject has been covered: I. Needs and Uses; II. Obtaining Occupational Information; III. Describing Jobs and Occupations; IV. Classifying Occupations and Jobs; V. Using the Dictionary; VI. Occupational Families; VII. Entry Field of Work; VIII. Military Occupations; IX. Industries and Patterns of Occupations; X. Jobs for the Handicapped; XI. Employment and Training Opportunities.

The appendix gives sources of occupational information, a sample of a job analysis, Bureau of Census occupational and industrial classification, and suggestions for filing unbound occupational information.

The Practice of Printing

By Ralph W. Polk. Cloth, 324 pp., 5¾ by 8¾ in., illus., $3.60. Chas. A. Bennett Co., Inc., Peoria 3, Ill.

This is the fourth revision of a fundamental textbook in typesetting and simple letterpress work. The book has been popular since it first appeared in 1925 and authors and publishers have combined to make this newest edition not only more complete and clear cut in its statement of the processes of typesetting, form make-up, and presswork but they have worked intelligently to make the book illustrative of the best present-day text in typography and commercial display.

The typographical purist who may be inclined to differ with the author in his capitalization and his use of initial letters and who may in his own practice demand greater harmony in the use of modern and old style types cannot but agree that the present book is distinctly modern, that the effects produced by the author's ideas in page outlay, display, and in his examples of commercial typography, are in complete harmony with present-day ideas. The publishers have provided the best quality of printing and binding so that the book is a fine example of textbook making.

Practical Mathematics

By Claude Irwin Palmer and Samuel Fletcher Bibb. Cloth, 769 pp., 5¾ by 8¼ in., illus., $4.50. McGraw-Hill Book Co., New York, N. Y.

This is the fourth edition. It contains the material formerly appearing in four separate volumes.

The book gives clear directions for solving the many problems contained in the four parts into which it has been divided.

The elements of arithmetic, geometry, algebra, and logarithms, and trigonometry are all presented in such a manner that the average student has little trouble in grasping them.

A number of useful tables have been added at the end of the book.

Jewelry Making for Schools, Tradesmen, Craftsmen

By Murry Bovin. Paper cover, 128 pp., 7¾ by 10½ in., illus., $2.50. Cloth binding, $3.50. Published by Murry Bovin, 68–36 108th St., Forest Hills, L.I., N. Y.

The author of this book, as the title indicates, had in mind the learner as well as the craftsman and dealer. His explanations are clear and concise, and the illustrations used, especially the line cuts, are good.

The fundamental jewelry processes, such as soldering, pickling, stripping, annealing, sawing, filing, polishing, hardening, wire and tube drawing, are all explained and illustrated.

The decorative processes, such as chasing, repoussé, etching, engraving, enameling, and gold and rhodium plating are thoroughly discussed.

Casting, stones and stone setting, design and construction, are concisely and clearly presented.

The appendix contains a useful list of sources of supplies, tools, and materials, and a list of references for those interested in jewelry.

Better Frames for Your Pictures

By Frederic Taubes. Cloth, 144 pp., 6⅛ by 9½ in., illus., $3.75. Studio-Crowell, Publishers, New York City.

A book which aims to help the young painter to frame his own pictures at a moderate cost.

It describes how to choose moldings that are suitable and then shows how the frames are made and finished.

Frames and mats for water colors, pastels, drawings, and prints also are discussed.

The last chapter explains how pictures may be hung so as to display them in the best manner.

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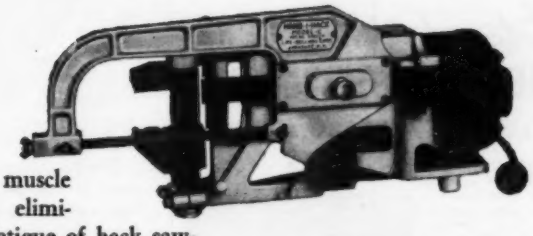

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The Oven is controlled by a newly developed thermostatic control, sealed in and conveniently placed on the front panel, of the Oven. It can accurately be set at any desired temperature where a quick rate of heat up to 306° F. is desirable.

No. 600

Due to the Aluminum Construction, the Oven is very light in weight and can be carried from room or project to project. As it operates on 110 volt AC or DC, it can be plugged into any 110 volt receptacle.

SPECIFICATION

Model	Interior Size	Wattage 110V AC-DC	F.O.B. Phila. Price
600	12"Wx12"Dx12"H	700	$ 75.00
602	24"Wx12"Dx12"H	1400	125.00

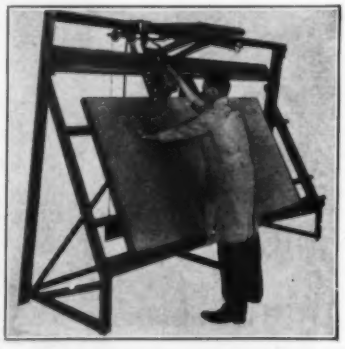
THE ELECTRIC Hotpack COMPANY, INC.
5067 Cottman Ave. Philadelphia 35, Pa.

SHOP EQUIPMENT NEWS

THE WALLACE NO. 48 PANEL SAW

The new Wallace No. 48 panel saw provides a low-cost method for sawing plywood panels with one-man labor expense.

Developed on the "move the saw, not the stock" rule of economy, the unit is made with an inclined bed on which one man can easily place the panel. An adjustable overhead way supports the carriage — which is rolled from left to right along a scale to the desired length of cutoff. Locked at this point, the saw is then pulled downward to make the cut.



Wallace No. 48 Panel Saw

For ripping, the motor unit rotates 90 deg., and is provided with an adjustable stop to locate the position. The saw can also be tilted for bevel rip, or bevel crosscut work. Machine may also be used for dadoing, plowing, and cutoff work on board stock. Crosscuts up to 48 in. wide, rips to 8 ft. long.

Taper-roller bearings on moving parts, with take-up collars, provide long-life accuracy. Counterbalanced mechanism is easy to handle.

The machine takes only 11½ by 3½-ft. floor area. It can be placed along a wall because it does not need additional end clearance. Requires access only from front of machine for convenience of operator.

For complete data, write to *J. D. Wallace & Co., 140 S. California Ave., Chicago 12, Ill.*

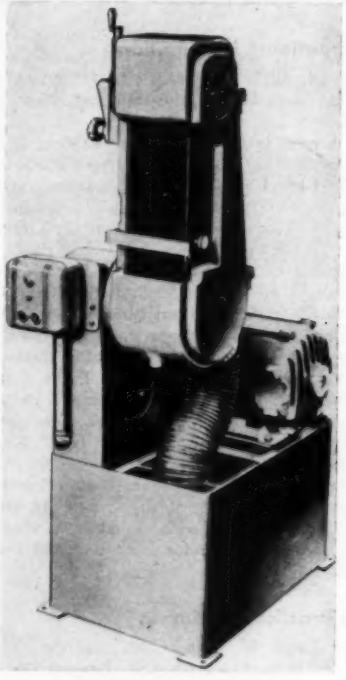
For brief reference use IAVE — 1001.

NEW ABRASIVE-BELT GRINDER

A new all-purpose belt grinder which is adaptable to a wide range of grinding operations has just been placed on the market by the Porter-Cable Machine Company. Equipped with a standard 6-in. belt which runs over a 12½-in. platen, the new grinder is an economical size for medium work.

The grinder, Model 506, is used primarily for freehand applications on work which requires flat surfaces, deburring, squaring, chamfering, rounding, and polishing. It is suitable for metal, wood, glass, and plastics applications.

This new machine can be changed over from vertical to horizontal operation in only one minute by simply loosening two hex nuts. For smaller pieces, particularly for those having more length than thickness, the machine is usually set in its vertical position. The work is supported by a work rest and squared with the platen.



Model 506 Belt Grinder

The machine is equipped with two-speed pulleys for 3300 and 4000 sfpm. The pulleys are quickly and easily changed to the proper surfacing speed for metal, wood, or glass. An optional set of pulleys for 2400 and 5500 sfpm is also available at no extra cost.

A pretensioning device eliminates the need for releasing the entire idler tension pressure each time the belt is changed. An adjustment knob provides speedy belt alignment.

The drive unit for the machine is 3 h.p., 220/440 volts, 60 cycle, 3 phase, 1750 r.p.m. It is totally enclosed with across-the-line starter and wiring.

A worktable is available as accessory equipment. It is 10 in. wide by 7 in. deep, adjustable to 45 deg. The table is slotted for a gauge which is adjustable through 90 deg.

This firm also has published a case study booklet on "Abrasive Belt Machines."

For further information write to *Porter-Cable Machine Co., Dept. PR-3, Syracuse 8, N. Y.*

For brief reference use IAVE — 1002.

A NEW DADO ASSEMBLY

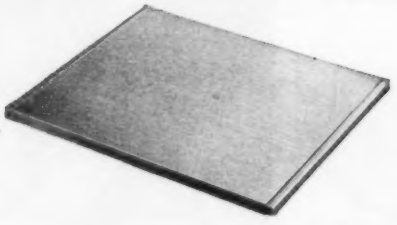
A complete, self-contained dado assembly is being introduced by Magna Engineering Corporation, Menlo Park, Calif. Called Magna Dado, it features a geared hub and has no loose parts.

A new type guard fully covers the pulley spindle, and the spindle itself runs in four heavy grease-sealed ball bearings.

An extra wide selection of speeds is available in two ranges, 500, 925, 1750, 3250, and 5500 in the high and 425, 775, 1330, 2200, and 3340 in the low.

(Continued on page 34A)

MAYLINE



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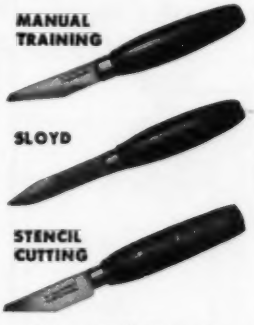

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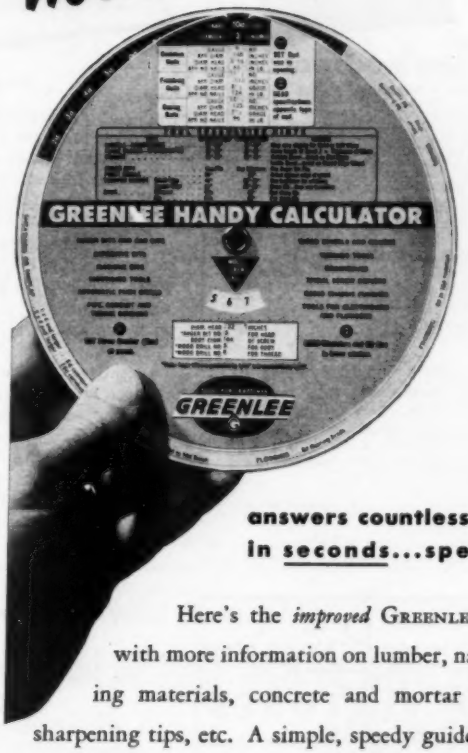
New improved woodworking calculator



answers countless questions in seconds...speeds jobs!

Here's the *improved* GREENLEE Calculator with more information on lumber, nails, painting materials, concrete and mortar mixes, tool sharpening tips, etc. A simple, speedy guide to more precise workmanship. Convenient . . . easy to read. Just set dial for nail specifications, to convert linear to board feet, find bit sizes for screws, compare characteristics of various woods. 6" diameter, heavily varnished cardboard printed in three colors.

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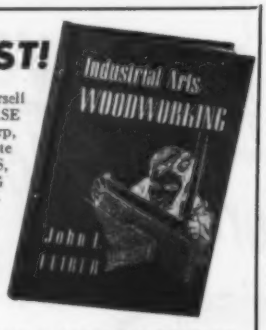

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The truly comprehensive woodworking textbook that's superior to all others! Covers all procedures step-by-step from cutting out the rough stock to finishing the project. Explains and illustrates all varieties of hand tool and simple machine work. 4 major parts for convenient use: fundamental processes in hand woodworking; basic machine tools; wood and wood products . . . opportunities in woodworking; 44 beautiful, practical projects. 478 illustrations. *By John L. Feirer*, $2.88. Book No. 1 in coupon.

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Another very popular clamp for the school shop is our Style #120 "JORGENSEN" "C" Clamps. Exceptionally strong and low in price, they offer the greatest value in "C" clamps for regular service. The deep throat is an advantage sought by many users. Carefully designed and liberally proportioned for most satisfactory, economical service.

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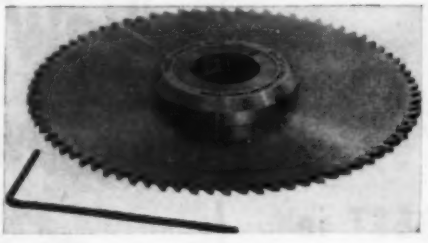
SHOP EQUIPMENT NEWS

(Continued from page 32A)



Magna Dado

A new brochure fully describing and illustrating this new line of drill presses will be sent free to anyone addressing *Boice-Crane Co., 932 Central Ave., Toledo 6, Ohio.*

Magna Dado's 8-in. blade is the only blade specially designed for oscillating dado cutting. It is extra heavy (⅛ in. thick) and has a unique tooth profile. The large diameter of the blade permits cuts up to 2 in. Fits saws with ⅝- or ¾-in. arbors.

An Allen wrench activates the hub gears. Calibrations provide setting guides, but an infinite range of widths between 5/32 and 7/8 in. is possible by using settings between calibrations.

Width changes are quick and easy, because no chippers or shims need be removed or added. Simply loosen the arbor nut, the hub gears are freed for quick readjustment.

Magna Dado can be resharpened by any professional saw filer.

For further information, address *Magna Engineering Corp., Menlo Park, Calif.*

For brief reference use IAVE — 1003.

THE NO. 1650 SERIES BOICE-CRANE DRILL PRESSES

A new drive-belt alignment device and other improved features have been incorporated in the new 1650 Series drill presses just being marketed by Boice-Crane Company, Toledo. One of the new additions is the two-way drive aligner-belt tensioner. The belt tension may be released instantly for quick, easy speed changing.

For brief reference use IAVE — 1004.

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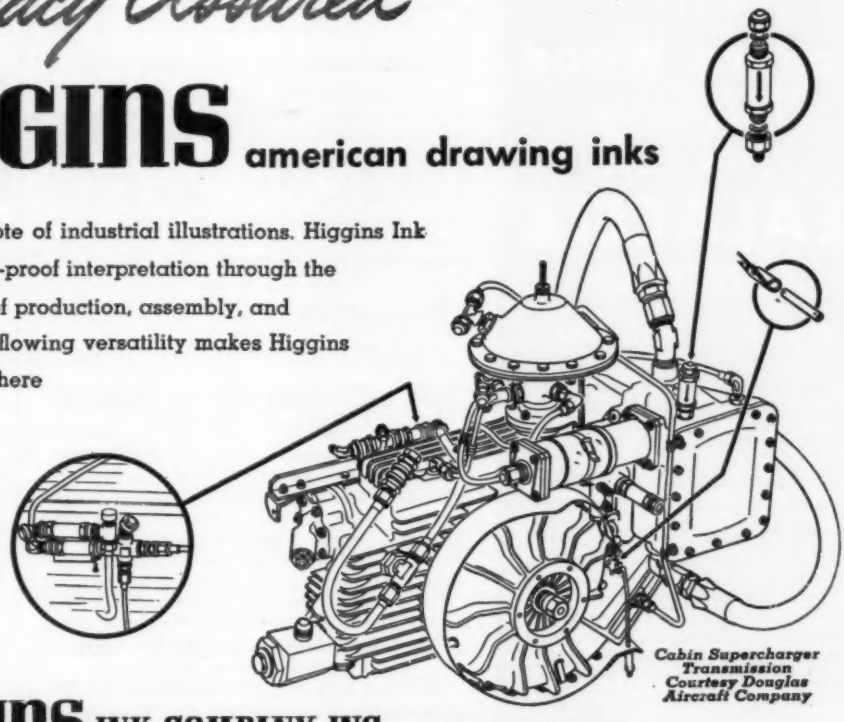

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By George A. Soderberg. New 1952. This is the first complete book published on finishing in many years. It discusses up-to-date materials and processes, safety and health hazards. 26 "how to" units give easy-to-follow instructions on wood surfaces, metal finishes, flock, dry wall construction finishes and numerous other recent developments. 320 pages with 189 illustrations, cloth bound. $4.00

"MACHINE WOODWORKING"

By Robert E. Smith. Detailed instruction for operation of woodworking machinery. Clear line drawings illustrate the operation units and make it easy to visualize the proper way to do it. 152 pages, 244 illustrations. $3.00

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SHOP EQUIPMENT NEWS

(Continued from page 34A)

SOUTH BEND CATALOG NO. 5205

South Bend Lathe Works have just published their new catalog No. 5205 describing the lathes, drill presses, bench shapers, and accessories which they manufacture.

The brochure gives an interesting description of the meticulous care expended to attain accuracy. Described also are the motion picture films, books, and wall charts that the firm has developed for the school shop.

A copy of this catalog may be secured by writing to *South Bend Lathe Works, South Bend 22, Ind.*

For brief reference use IAVE — 1005.

1953 CINCINNATI MILLING MACHINE COMPANY CATALOG

The 1953 General Catalog of the Cincinnati Milling Machine Company is now available. The catalog is beautifully illustrated and gives concise descriptions and specifications of the milling, lapping, grinding, broaching, die sinking, metal forming, flame hardening, cutter sharpening, machines, and accessories manufactured by this firm.

For a copy of this catalog write to *The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.*

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The above activities were conducted in the various fields to which this magazine is dedicated and included content, methods and life and employment adjustment.

Please note the article Common Learnings and Common Doings in Industrial Arts and Vocational Education run in the November issue on page 300. Also please note the article Tool Kits for Learners, Workers, Managers, and Superintendents run in the November issue 1950.

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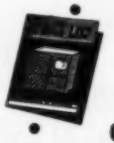

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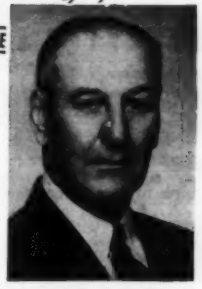

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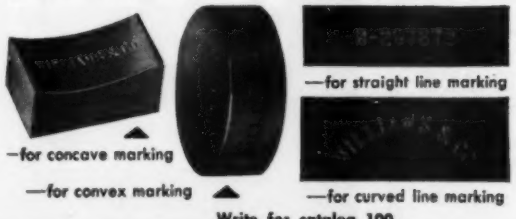

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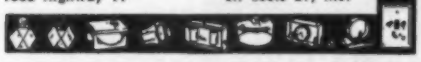

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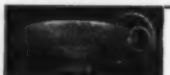

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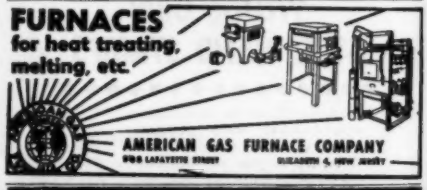

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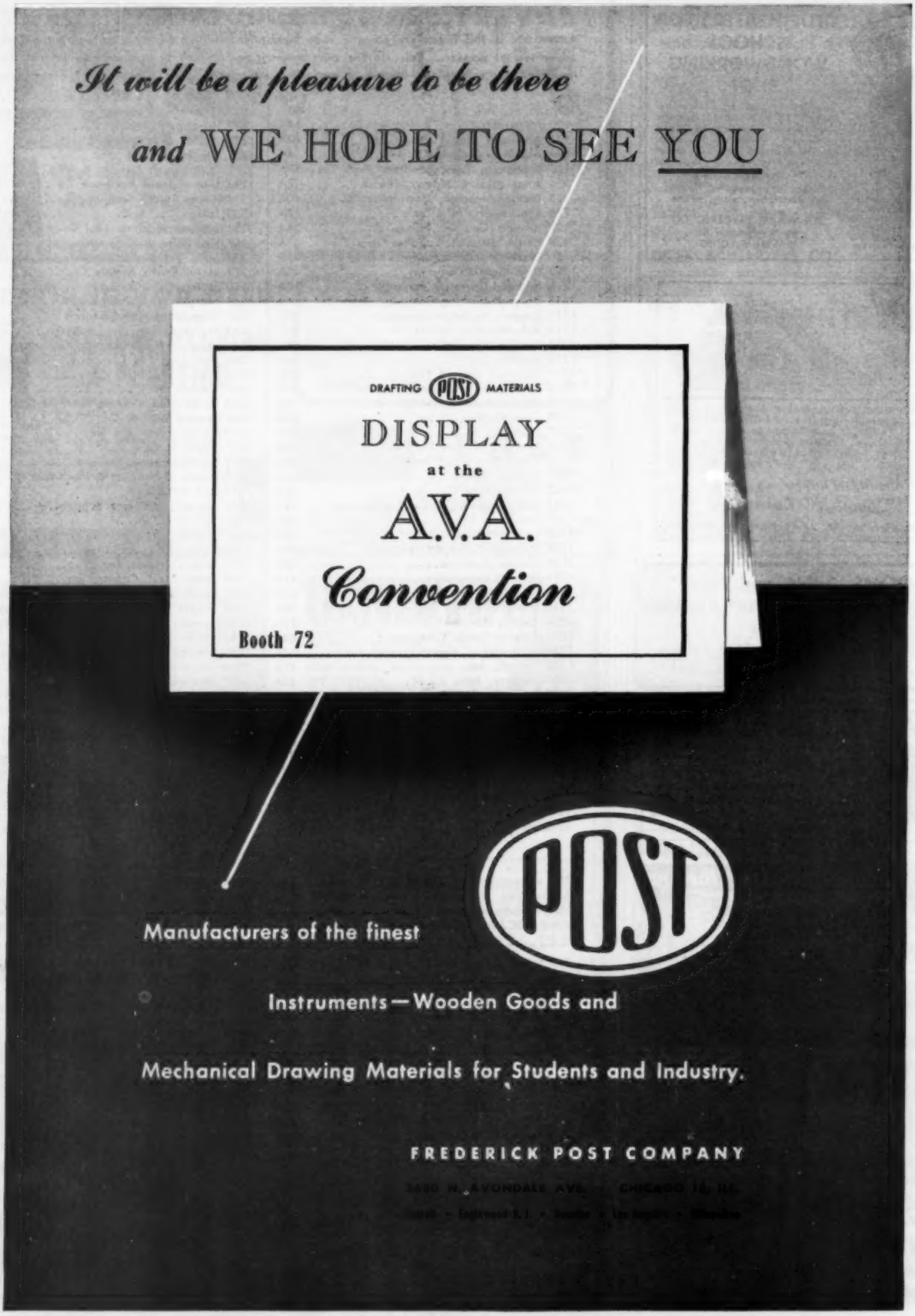
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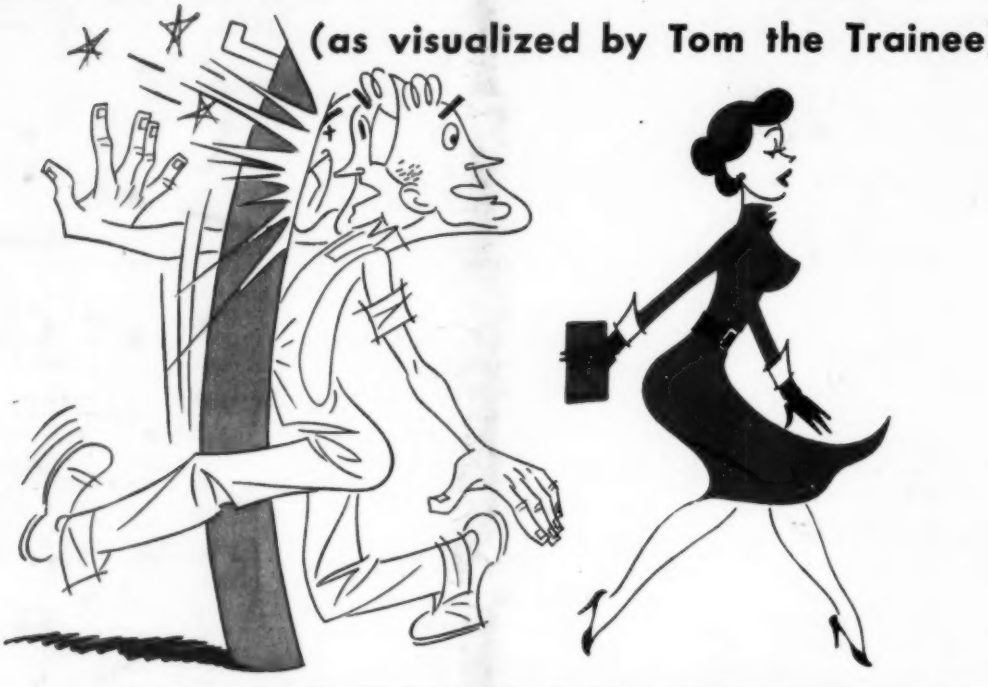

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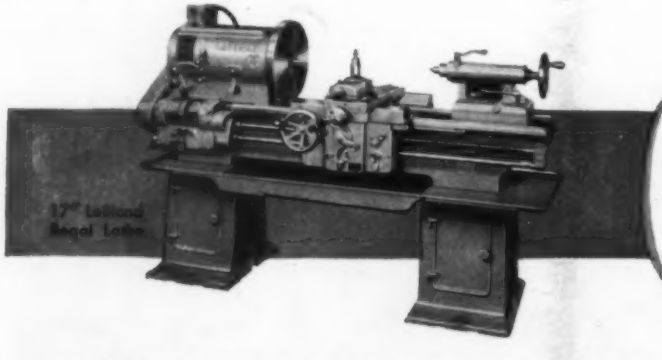

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